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GAS JOURNAL

LIGHT ∴ HEAT ∴ POWER

BYE-PRODUCTS.

Founded in 1849 as the "Journal of Gas Lighting."

VOL. CCI.

JANUARY TO MARCH, 1933.

LONDON:

WALTER KING, LTD.,

11, BOLT COURT, FLEET STREET, E.C. 4.

1933.

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Technology

GAS JOURNAL

LIGHT · HEAT · POWER · BY-PRODUCTS

Vol. 201. 85th Year. | LONDON, JANUARY 4, 1933. | No. 3633. Price 1s.

OXIDE OF IRON
SPENT OXIDE
Gas Purification & Chemical Co.
— LTD. —
PALMERSTON HOUSE, LONDON, E.C. 2

Certus & Capax
METERS.
George Wilson Gas Meters LTD.
See Advert. next week.

"LUX"
Purifying Material from STOCK.
THOS. DUXBURY & CO.,
16, Deansgate, Manchester.
Palace Chambers, Westminster, S.W. 1

Broadhead Constructions Limited.

Road and Rail Traffic
WEIGHBRIDGES
Whessoe Weighbridges, by their construction, give life-long service at low cost.
THE WHESSOE FOUNDRY & ENGINEERING CO., LTD.
Write to Dept. "W B.," DARLINGTON, DURHAM.

SIMPLEX
WATER GAS PLANT
& ORDINARY HORIZONTALS PRODUCE
90 THERMS PER TON
WITHOUT INCREASED LABOUR COSTS OR AUXILIARY PLANT
Vertical Gas Retort Syndicate, LTD.
17, VICTORIA STREET, WESTMINSTER, S.W.1

M & M
"NEW M" PATENT METER LOCKS.
See advertisement of George Glover & Co., Ltd., below.

NATURAL STEEL GREY
FERRODOR
PAINT
FOR GAS HOLDERS
Made with "Ferrodor" Ore — an indestructible, flaky pigment which interleaves and forms a perfect protective coating against corrosion.
Griffiths Bros. & Co. London Ltd.
Bermondsey, London, S.E. 16

JAMES McKELVIE & CO.
Coal Owners,
Gas and Steam Coal Contractors,
17, RUTLAND SQUARE, EDINBURGH, I.
Astor House, Aldwych, London, W.C.2.
Guildhall Chambers, Sandhill, Newcastle-on-Tyne, I.
24, Chapel Street, Liverpool.
ESTABLISHED 1840.

COWAN'S METERS

(See Advertisement on p. III. of Wrapper.)

GEORGE GLOVER & CO LTD

Dry Meter Manufacturers & Repairers

The "New M" Patent Lock

This new lock (formerly known as the "M and M" padlock) is stronger and more secure than the original pattern, and improved methods of manufacture have resulted in a considerable price reduction.

See that each lock is stamped "New M"

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Wire: "Dry Meters Phone London."

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Ranelagh Meter Works, East Park View
Telephone; No. 26463.
Wire: "Meters Phone Leeds."

MANCHESTER
City Meter Works, Port Street
Telephone: No. 6898 City.
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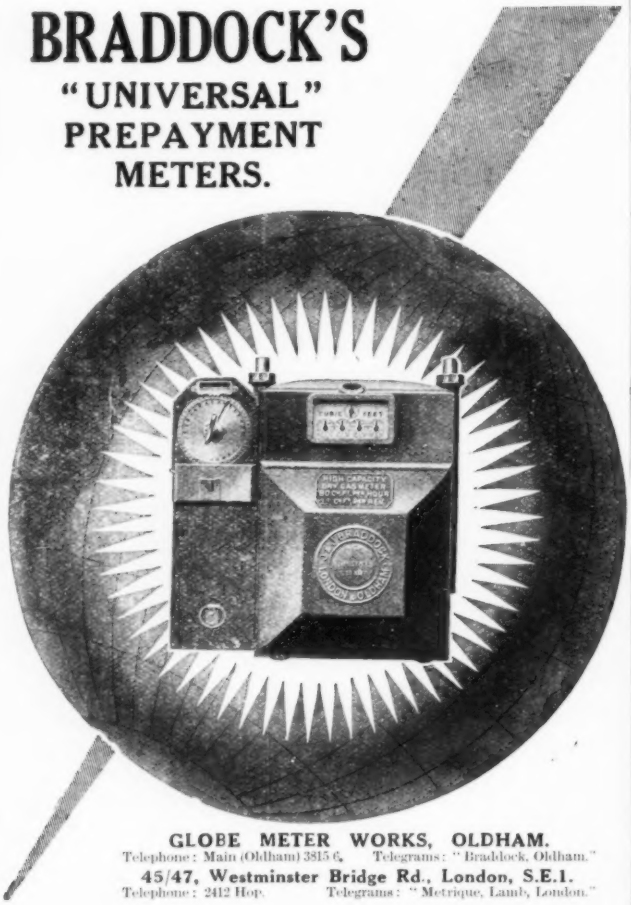
"UNIVERSAL" PREPAYMENT METERS.



GLOBE METER WORKS, OLDHAM.
Telephone: Main (Oldham) 3815 6. Telegrams: "Braddock, Oldham."
45/47, Westminster Bridge Rd., London, S.E.1.
Telephone: 2412 Hop. Telegrams: "Metrique, Lamb, London."

GLENBOIG GAS RETORTS

have been known to..

STAND 2380 WORKING DAYS

Gas Retorts made with Glenboig Fireclay are capable of resisting greatest heats and most rapid changes of temperature. Glenboig Gas Retorts have been known to stand 2380 working days. Nearly seven years.

Sole Proprietors and Manufacturers:
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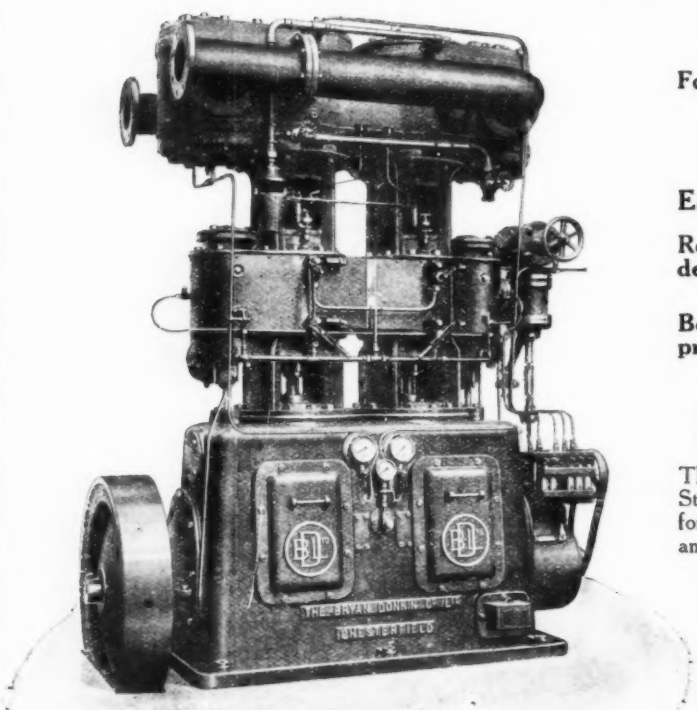
DONKIN GAS COMPRESSORS



High Speed
Vertical Reciprocating type
For pressures up to 100 lbs. per sq. inch

Automatic Control
operated by Gas Pressure

Easy Accessibility to Working Parts

Robust construction, and of the very latest design. Perfect balance, ensuring absence of vibration at high speeds.

Bearings and all working parts of ample proportions, giving absence of wear and ensuring long life.

Can be supplied as a Steam-driven Compressor, or driven by Gas Engine, Electric Motor or Belt.

The illustration shows a High Speed Duplex Steam-driven Reciprocating Compressor fitted with forced lubrication to all bearings—Automatic Suction and Delivery Valves—one common inlet and outlet branch for both cylinders.

THE
BRYAN DONKIN
CO., LTD.,
CHESTERFIELD.

GAS JOURNAL

LIGHT . HEAT . POWER . BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

Vol. 201. 85th Year. LONDON, JANUARY 4, 1933. No. 3633. Price 1s.

Can You Imagine

your old black gas cookers transformed from dull utility into smart, attractive cookers, with the modern mottled finish that is welcome in any kitchen? If not, send us a cooker to be finished in "Foochow" Oriental Lacquer and we will show you how this is done.

The new Foochow "500" Lacquer, with 100° greater heat resistance, is a perfect finish for cookers.

Also applicable to Fires, Geysers, Radiators, etc.

Foochow Oriental Lacquer

DONALD MACPHERSON & CO., LTD.
MITCHAM, LONDON, AND KNOTT MILL, MANCHESTER

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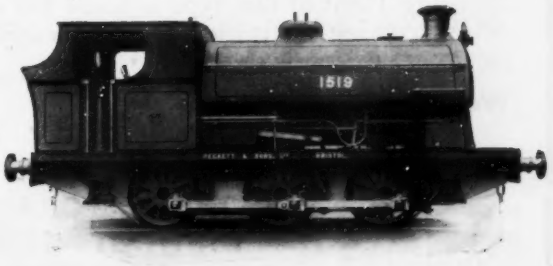
LOCOMOTIVES



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Photographs, Specifications, and Prices on Application.

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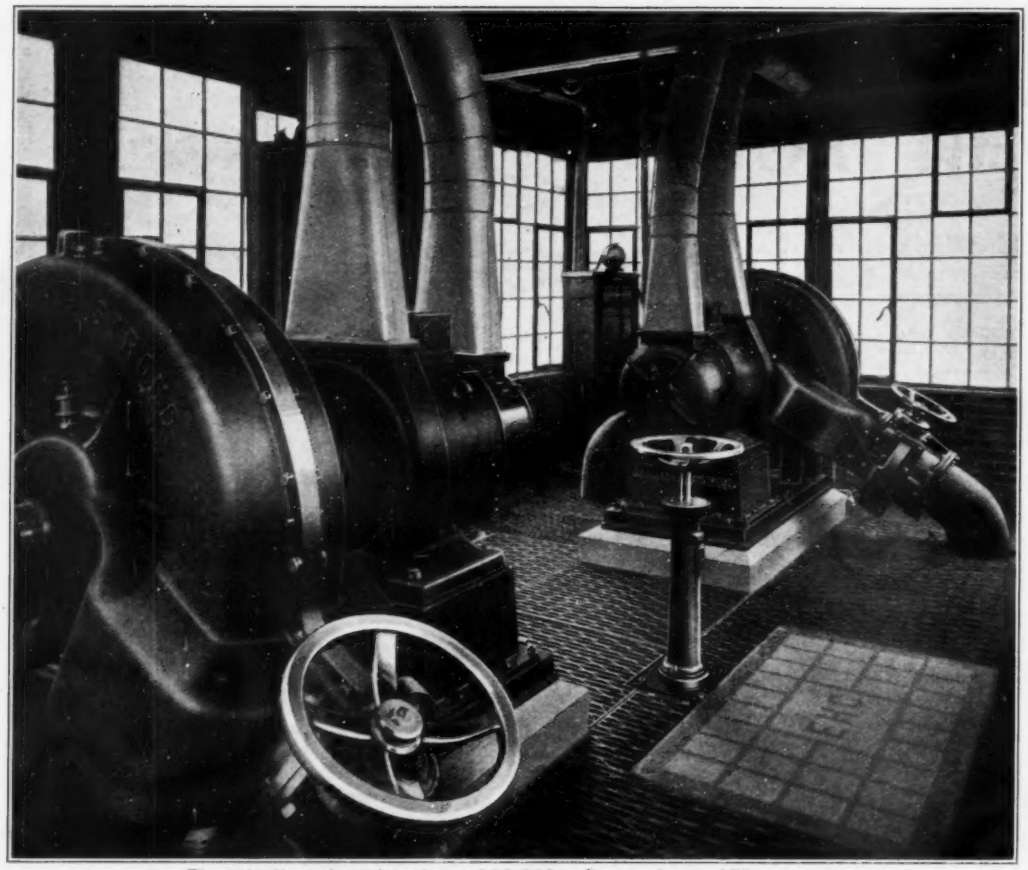
PATENT RETORTS, LIMITED,

SUPPLIERS OF

COMPLETE GASIFICATION PLANTS, ALSO **ROTARY RETORTS FOR TREATING COAL AND SHALE.**

5, VICTORIA STREET, LONDON, S.W.1.

GAS BOOSTING



Electrically driven boosters, 300,000 c.ft. per hour, 15" pressure.

We have a complete range of fans to cover wide requirements of pressure and volume. Our BOOSTING FANS are sturdily built for RELIABILITY and LONG SERVICE. The blades of the impellers are specially designed to meet gasworks requirements in maintaining constant efficiency over the widest possible range of pressure and volume.

Boosting Plant of this type is ideal for meeting the demand of Cooking or Peak Loads, or overcoming difficulties due to uncupping of Holders, etc.

We also specialise in—

ROTARY COMPRESSORS
HORIZONTAL & VERTICAL RECIPROCATING COMPRESSORS
"MICHELL" CRANKLESS COMPRESSORS
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EXHAUSTING MACHINERY
GAS-VALVES — "PHŒNIX" PATENT DOUBLE FACED
PUMPS FOR GASWORKS PURPOSES
COKE BREAKING PLANT
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and issue separate catalogues dealing with these.

GEO. WALLER & SON, Ltd. PHŒNIX IRON WORKS, STROUD, GLOS.

Telegrams: "WALLER, BRIMSCOMBE." Telephone: 10 BRIMSCOMBE.

LONDON OFFICE: 149-150, PALACE CHAMBERS, S.W.1. Telephone WHITEHALL 5526.

AGENTS FOR SCOTLAND MESSRS. MILNE & MITCHELL, 75, BATH STREET, GLASGOW, C.2.

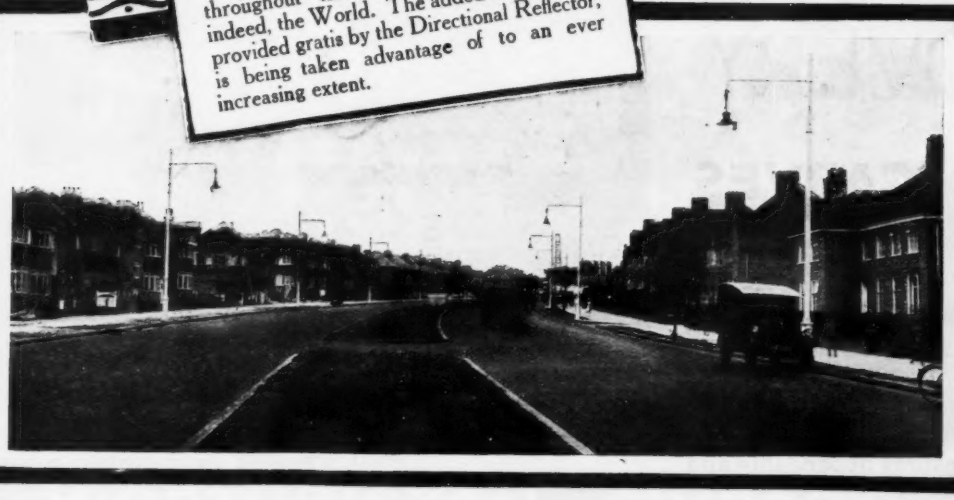
SEVEN SISTERS ROAD, LONDON. N.

The lamp fitted with Sugg's Directional Reflector which increases Candle Power enormously.

Famous London Streets *Lighted by*

Sugg's 'ROCHESTER' LAMPS

The illustrations show only two of the important thoroughfares of London which are lighted by Sugg's famous lamps; they are used also in many towns and cities throughout the United Kingdom and, indeed, the World. The added illumination, provided gratis by the Directional Reflector, is being taken advantage of to an ever increasing extent.



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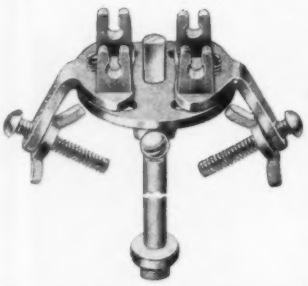
INCREASED ILLUMINATION.

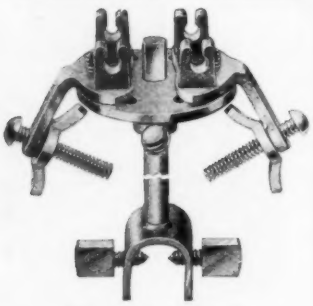


Type "GA"
For "PARKINSON" Inverted Burner Lantern.

Type "UA"
As supplied for Swan-neck Burners.

The "MOR-LITE"
PATENT
DIRECTIONAL REFLECTOR
WITH
IMPROVED ADJUSTABLE CLIP
(Patent Applied for).

ECONOMICAL. UNBREAKABLE.



Type "GSA"
For Inverted Burner Lanterns having Elbow Connections.

UNIVERSALLY ADJUSTABLE.—To meet the demand for a reflector having a greater range of adjustability, we can offer an improved type of Reflector, with the clip so constructed that the required adjustment about either a horizontal or a vertical axis, can be effected quickly and conveniently. The wings can be adjusted at various angles to give the necessary bias for bends in roads; and also to give the best results according to the height and spacing of Lamps.

WINGS INSTANTLY REMOVED.—This is a great advantage when cleaning Lamp Panes and re-mantling; the wings are removable by simply lifting off, and can be replaced in the same positions without disturbing the adjustment.

SAMPLES ON REQUEST.

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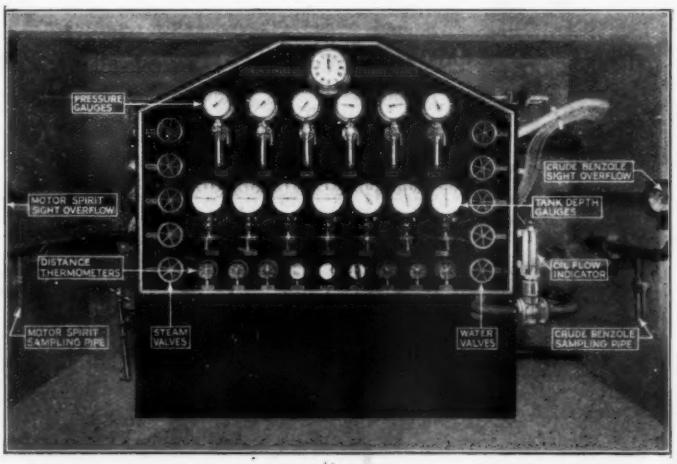
SIMPLICITY in BENZOLE RECOVERY

SIMON-CARVES BENZOLE PLANT

The centralized controls of the Simon-Carves Benzole Recovery plants give simplicity in operation and increased efficiency, whilst our experience of over 30 years in the construction of benzole plants ensures dependable and satisfactory operations.

Simon Carves Benzole Plants are now producing more than 50,000 gallons of benzole per day.



Control room on Simon-Carves' Benzole Plant producing motor benzole, erected for the Croydon Gas Company.

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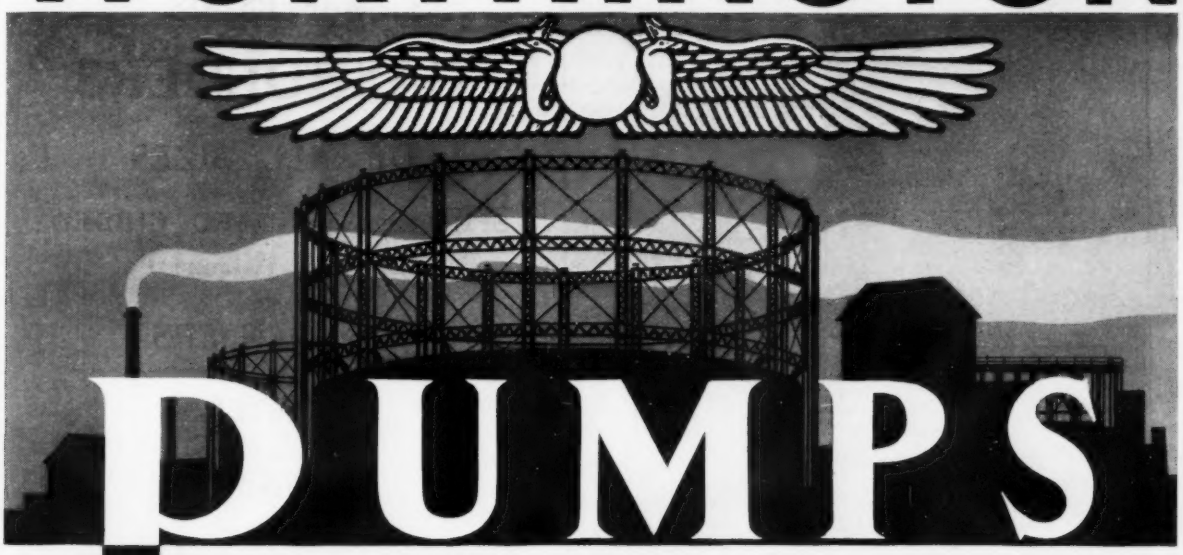
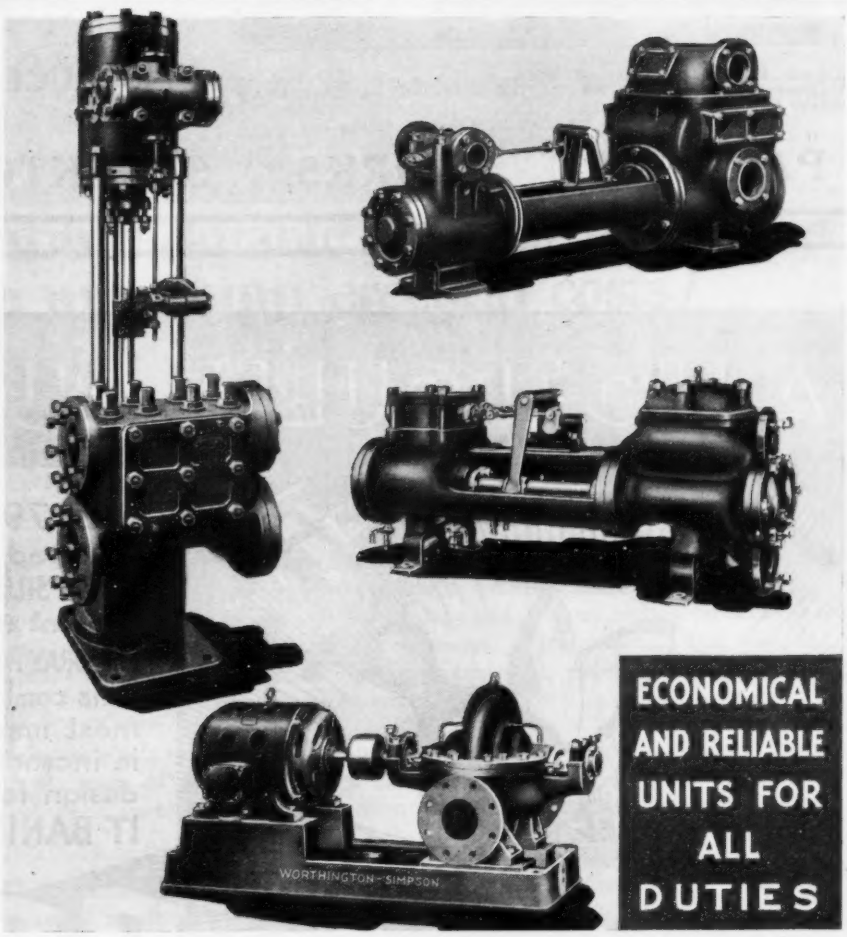


PUMPS

FOR THE GAS INDUSTRY



ECONOMICAL AND RELIABLE UNITS FOR ALL DUTIES

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TELEPHONES: 4271 HOLBORN (5 Lines).

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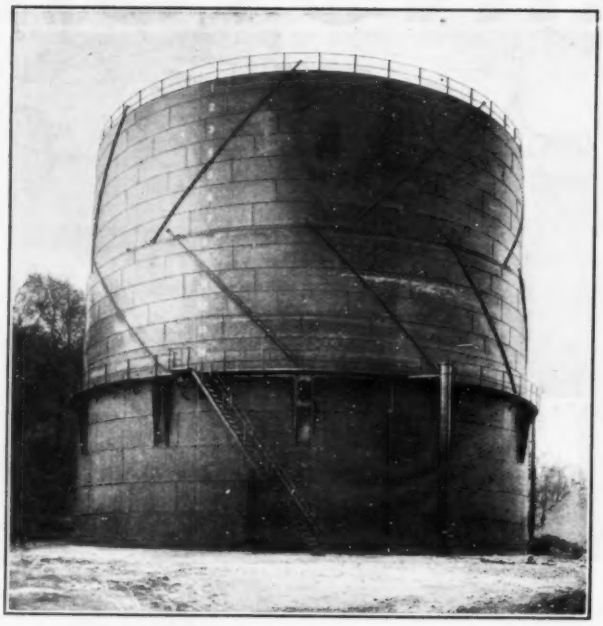


2-Lift Spiral-Guided Gasholder, 250,000 c.ft. cap. with Steel Tank at Chester-le-Street for THE NEWCASTLE-UPON-TYNE & GATESHEAD GAS CO.
(*Frank P. Tarratt Esq., M.Inst.C.E., M.Inst.Gas E., Engineer.*)

MAKERS OF

GASHOLDERS

OF ALL SIZES

SPIRAL: STANDARD GUIDED:
WATERLESS (Klonne Patent)

CONDENSERS

PURIFIERS

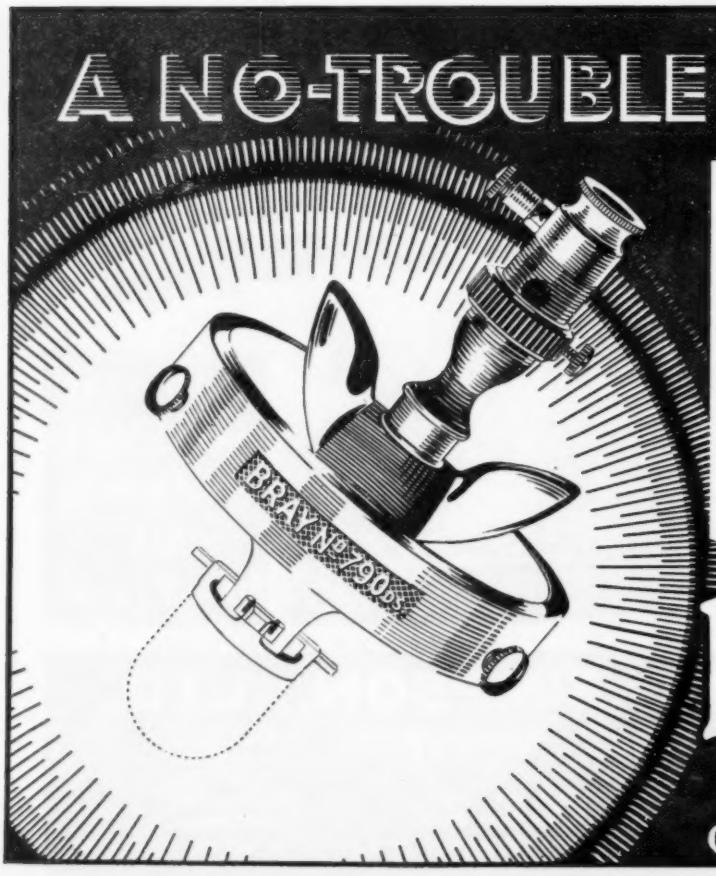
SCRUBBERS

WATER-GAS PLANT

PRODUCER GAS PLANT

PARKFIELD WORKS, STOCKTON-ON-TEES

A NO-TROUBLE BURNER



THE 790DS. BURNER is fitted with the BRAY SILENT REGULATOR (patent applied for) and the BRAY PATENTED DIFFUSER. This combination is the most important advance in incandescent burner design for many years: IT BANISHES NOISE.

BRAY
790DS.
BURNER
BRITISH MADE
GEO. BRAY & CO. LTD. LEEDS.

"EVERITE"
REGD. TRADE MARK
STANDARD
Asbestos-Cement
CORRUGATED SHEETS

New Barnet Gas Works, roofed with "EVERITE" Standard Corrugated Sheets.

Combine durable weather resistance with minimum erection costs!

The most effective and satisfactory method of ensuring weather-protection is to roof with "EVERITE" Standard Asbestos-Cement Corrugated Sheets. These possess a number of important advantages. They are light in weight and have a large cover area. They can be handled with ease and skilled labour is reduced to the absolute minimum. They can be cut to any size or shape. Rapidity of construction is assured, whilst upkeep cost is practically negligible as no painting or other treatment is required.

These sheets are suitable for the roofing and vertical cladding of all types of industrial buildings, whilst special curved sheets are available for the covering of semi-circular or Belfast roofs. The curved sheets can be supplied to any radius from 39 ins. upwards and are manufactured specially to customers' requirements. The standard sheets are made in lengths from 4 ft. to 10 ft., rising by 6 in. increments, with a width of 2 ft. 6 ins., and possess when laid a nett covering width of 2 ft. 1½ ins.

The illustrations give a very clear indication of the handsome appearance and clean outline of the roofs of the New Barnet Gas Works, where "EVERITE" Curved Sheets have been employed in conjunction with "EVERITE" Asbestos-Cement Rainwater Goods.

"EVERITE" Standard Corrugated Sheets are definitely fire-resisting and are impervious to all weathers.

Asbestos Cement Building Products Limited and the Companies with which it is associated own sixteen Works, ten Asbestos Mines, and employ over 15,000 people.

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'Phone: Midland 0245

GLASGOW: Castle Chambers, 65 Renfield Street.
'Phone: Douglas 2006

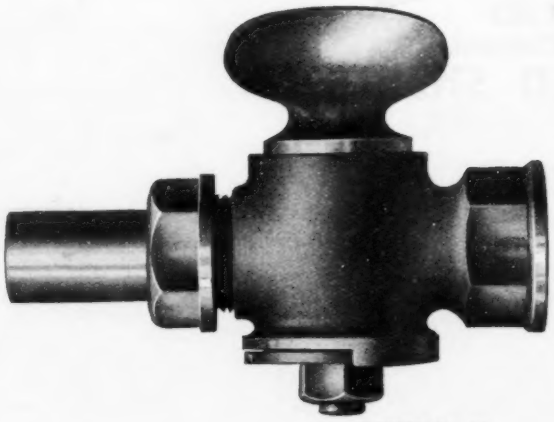
NEWCASTLE-ON-TYNE: Collingwood Buildings.
'Phone Central 25736

BRISTOL: West India House, Baldwin Street.
'Phone: Bristol 25743

ACBP

℗ E.C.7.

Quality



DESIGN No. 50

GUN-METAL MAIN COCKS

GEORGE ORME & CO.
(Branch of Meters Ltd.)
ATLAS METER WORKS
OLDHAM

We shall be pleased to receive enquiries for
SAMPLES & PRICES

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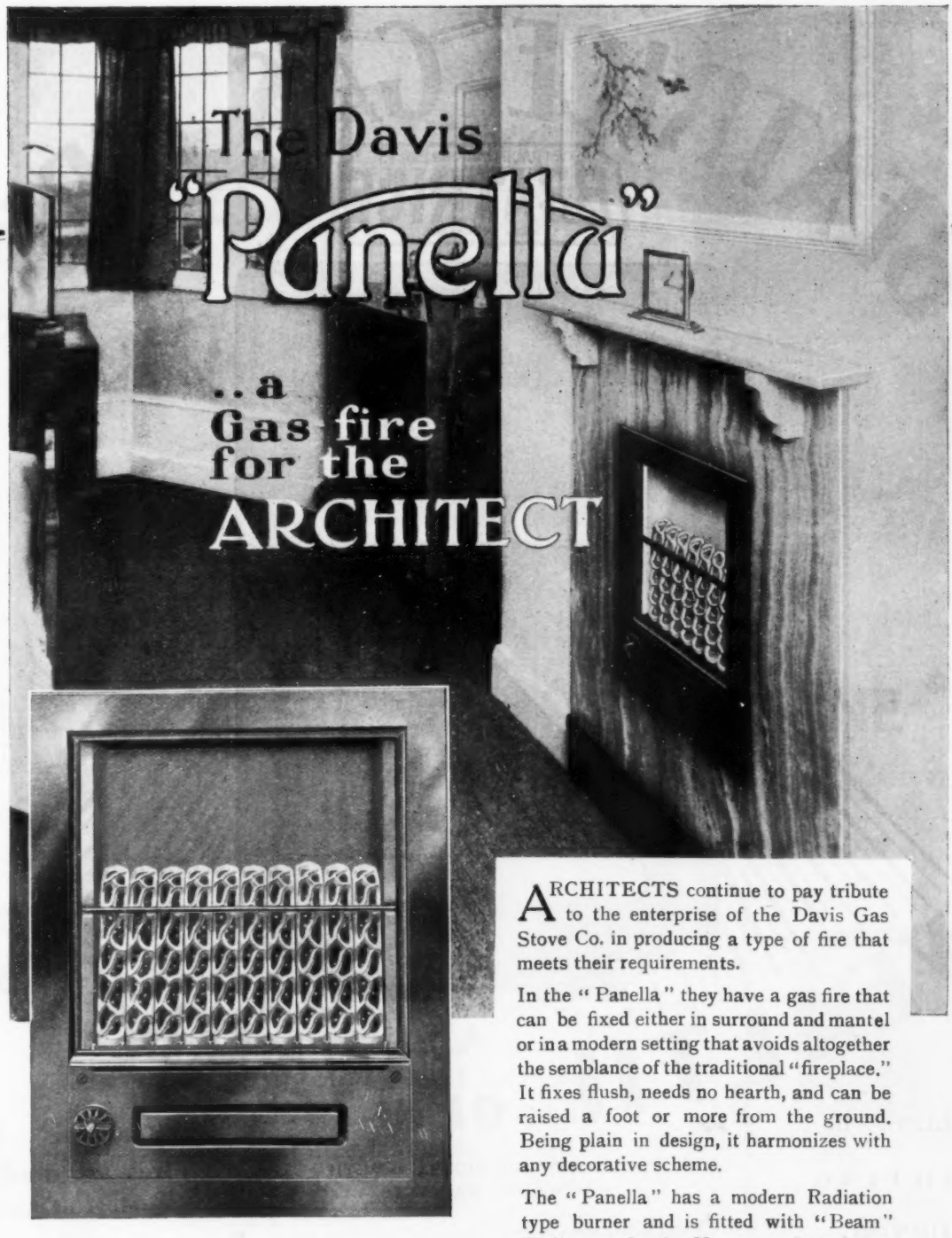
Anglo's GAS OIL

ANGLO-AMERICAN OIL CO. LTD.
36 QUEEN ANNE'S GATE-WESTMINSTER - LONDON - S.W.I.

D.A.128.



The "PANELLA" *Gas Fire.*

ARCHITECTS continue to pay tribute to the enterprise of the Davis Gas Stove Co. in producing a type of fire that meets their requirements.

In the "Panella" they have a gas fire that can be fixed either in surround and mantel or in a modern setting that avoids altogether the semblance of the traditional "fireplace." It fixes flush, needs no hearth, and can be raised a foot or more from the ground. Being plain in design, it harmonizes with any decorative scheme.

The "Panella" has a modern Radiation type burner and is fitted with "Beam" Radiants. In the Nos. 10 and 12 sizes a duplex tap enables either the whole fire or the centre radiants only to be used.

Send for Illustrated Price Lists.

The DAVIS GAS STOVE Co. LTD.

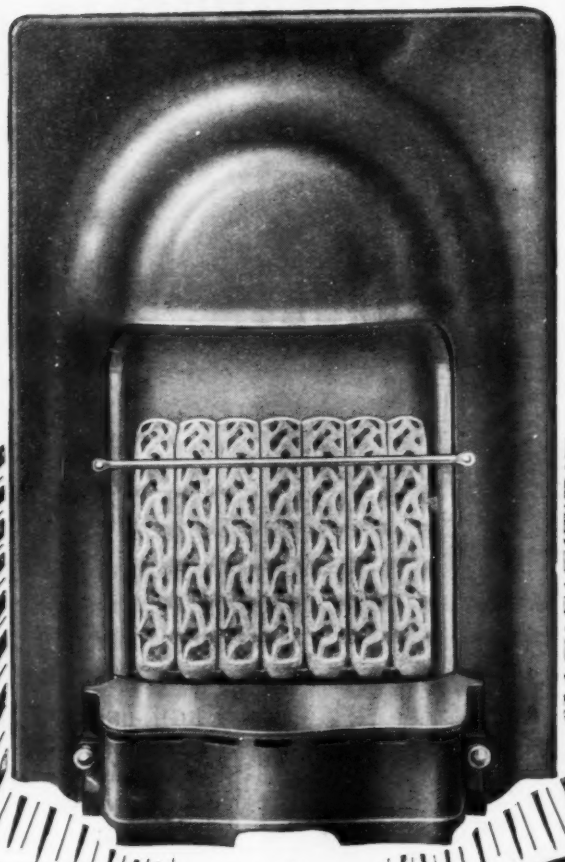
7, STRATFORD PLACE, LONDON, W.1

Works: LUTON

(Radiation Ltd., Proprietors)

"BEATRICE" GAS FIRES

REG° TRADE MARK N° 224,159
BEATRICE
MADE IN ENGLAND



A WEALTH OF WARMTH

SILENT in LIGHTING, BURNING and EXTINGUISHING.

ALL FIRES ARE SUPPLIED WITH "SUNGLOW RADIANTS."

Sole selling agents in Great Britain and Ireland for Gas Cookers manufactured by Messrs. John Harper & Co., Ltd.
ECONOMIC GAS BOILER Co. Ltd.
Junction Mills :: :: Burnley.
Telephone: 5305 Burnley
Telegrams: Bluboilers Burnley.

"Beatrice" Gas Fires are made in a variety of designs and finishes, Art Black and Vitreous Enamelled in Various Colours.

OUR REPRESENTATIVE WILL GLADLY CALL WITH SAMPLES FOR INSPECTION.

Manufacturers :

JOHN HARPER & CO., LTD.

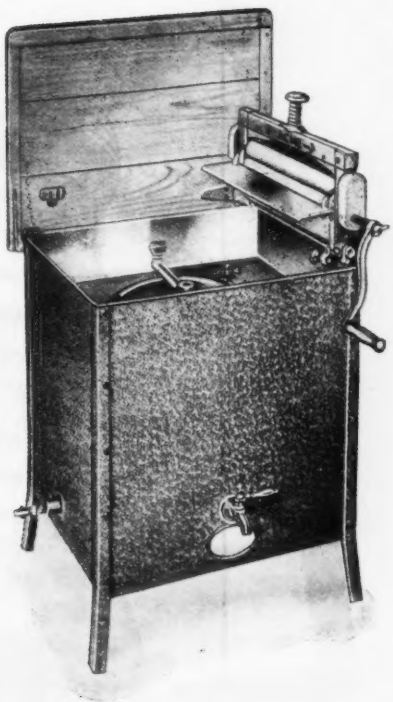
Telephones:
Willenhall 124 (4 lines).
Holborn 5154.

ALBION WORKS, WILLENHALL, STAFFS.

London Office: Atlantic House, 45/49, Holborn Viaduct, E.C.1

Telegrams:
Harpers, Willenhall.
Oilgas, Cent., London.

The Appliance of Today



THE
ECONOMIC
WASHING MACHINE ★

Comprising — Gas Boiler, Washer, Table & Wringer

★ *LABOUR SAVING*
STRONG CONSTRUCTION
ATTRACTIVE APPEARANCE

The "ECONOMIC" WASHING MACHINE is ideal for the modern Wash-house or Kitchen. Its strong construction together with compactness and neatness, are definite advantages; while its appearance leaves nothing to be desired, being finished in mottled porcelain enamel with chromium plated draw-off tap. It cannot fail to meet the most exacting requirements. The wringer is an *Acme*.

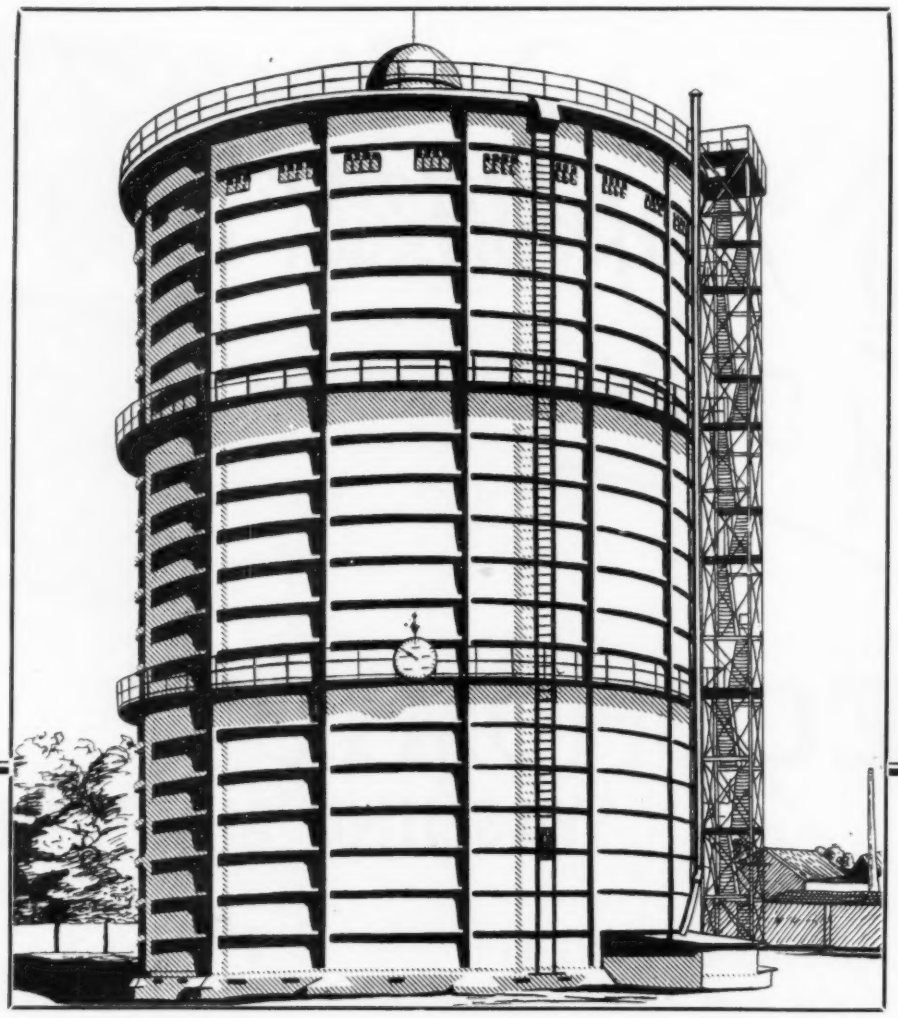
Note neat and compact appearance when closed.

Let 1933 be an "ECONOMIC" Year.

Sole Makers:

ECONOMIC
GAS BOILER Co., LTD.
JUNCTION MILLS, BURNLEY

Telephone: 3305 Burnley.
Telegrams: Bluboilers, Burnley.



51 WATERLESS (KLONNE) GASHOLDERS

COMPLETED OR UNDER CONSTRUCTION.

LICENSEES :—

DRY GASHOLDERS LTD.

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LICENSED MANUFACTURERS :—

SAML. CUTLER & SONS, LTD., 39, Victoria St., Westminster, S.W. 1.

C. & W. WALKER, LTD., Wellington, Salop.

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THE HORSELEY BRIDGE & ENGINEERING CO., LTD., Tipton, Staffs.

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The World's Greatest Value in 3-ton trucks - the "LEADER"

Behind this fine engineering job is the welcome news of a definite saving on your initial outlay, of anything up to 50%. Consider also these other advantages :—

- AMPLE POWER — 5 bearing crankshaft engine develops 60 h.p.
- NO EXTRAS TO BUY—you have a vehicle that is fully equipped, ready for the road.
- LABOUR - SAVING FEATURES — maintenance is easy and economical by reason of the clean design and special devices.
- HIGH SECOND - HAND VALUE — your purchase is an investment because of the re-sale value of all Morris-Commercials.

The Morris-Commercial range of vehicles includes:—

15-Cwt. Van - - -	£195
1-Ton Truck - - -	£198
30-Cwt. Lorry - -	£230
2-Ton Chassis - -	£226
2-Ton Truck - - -	£263
3-Ton Chassis - -	£399
3-Ton Truck (Normal C.)	£469
3-Ton Truck (Forward C.)	£539
4-Ton Chassis - -	£675
4-Ton Truck - - -	£780
5-Ton Chassis - -	£725
5-Ton Truck - - -	£865

Send for Catalogue 120 C.J.

Convenient Hire Purchase Terms arranged direct with M.C.C.Ltd.

MORRIS-COMMERCIAL

MORRIS COMMERCIAL CARS LTD. ADDERLEY PARK, BIRMINGHAM, 8.

GREETINGS FOR 1933

FROM

THE GAS METER COMPANY LIMITED.

We have in stock just the type of Prepayment or Ordinary Meter which you prefer, whether it be :—

1. THE NEW SMALL HIGH CAPACITY

METER, of which we shall be pleased to send particulars on application.

2. THE HIGH CAPACITY METER

3. THE STANDARD PATTERN METER

All types are constructed of the best Materials and embody the latest improvements dictated by experience and experiment which have become available since Dry Meters were first manufactured.

Our fast Motor Lorry Service is at your disposal for delivery of New Meters and the collection of Meters for Repair.

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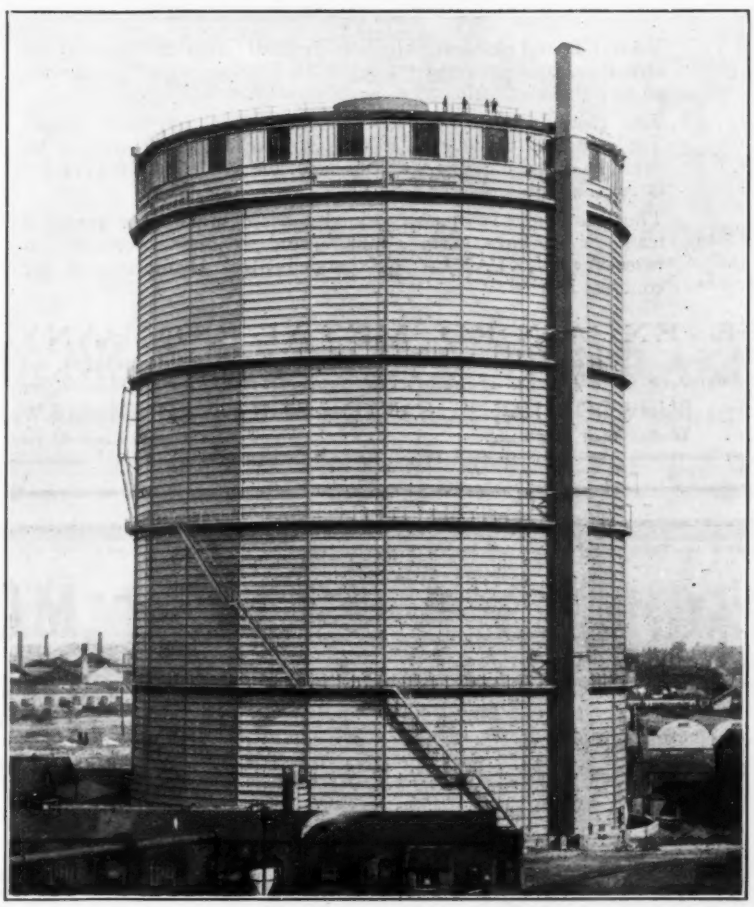

This 4,000,000 cub. ft. M.A.N. Waterless Holder replaces a Telescopic Holder of only 1,000,000 cub. ft. capacity. Demolition of old Gasholder was commenced in January; concrete base over existing tank finished in April, and the new "Waterless" completed in November of same year.

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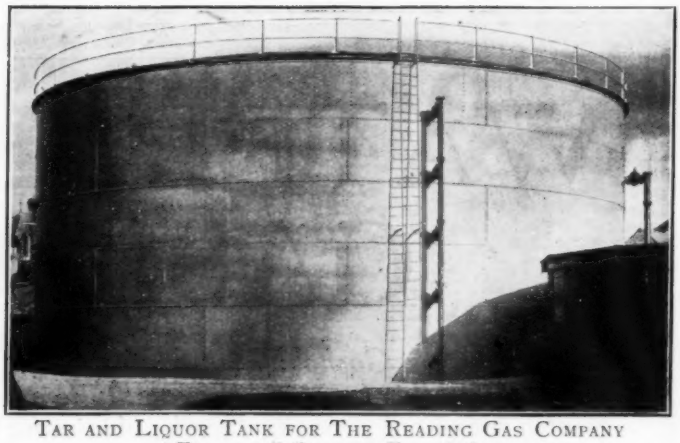

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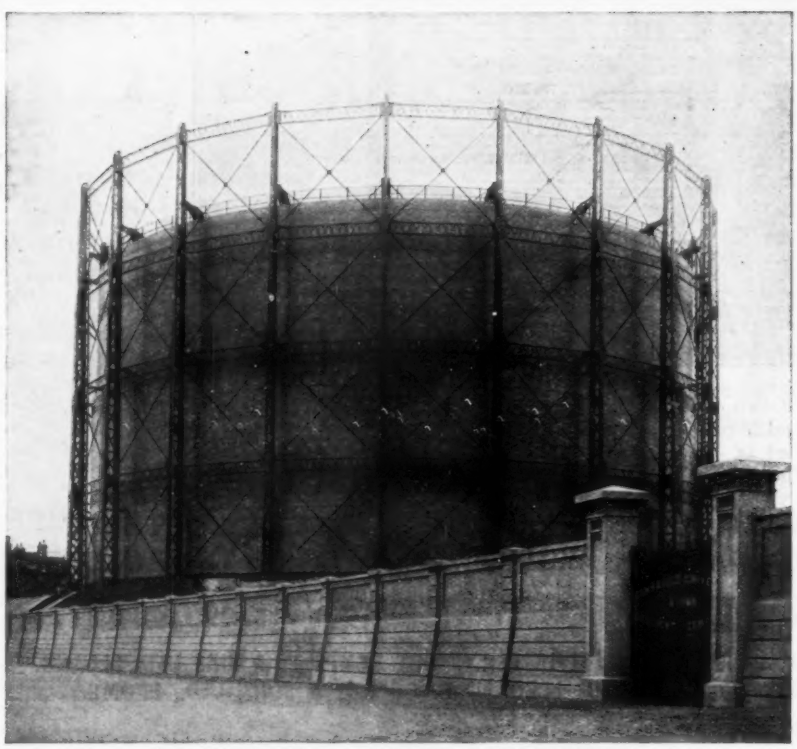

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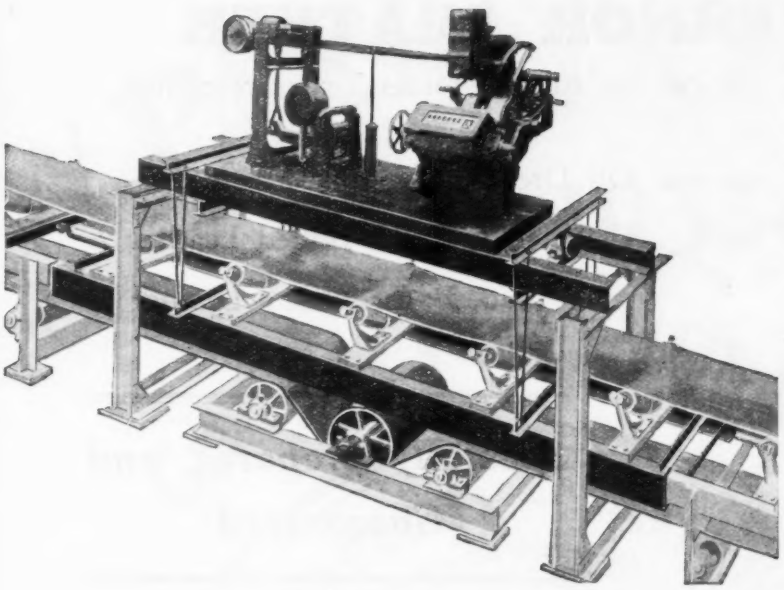

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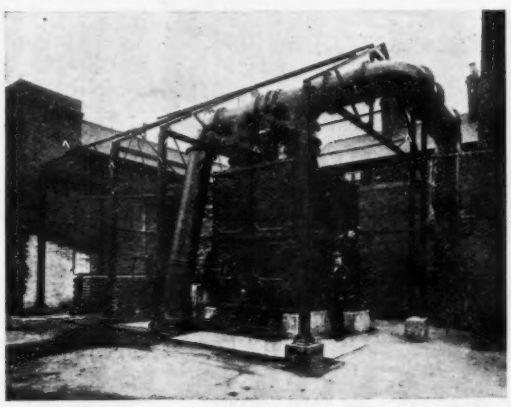

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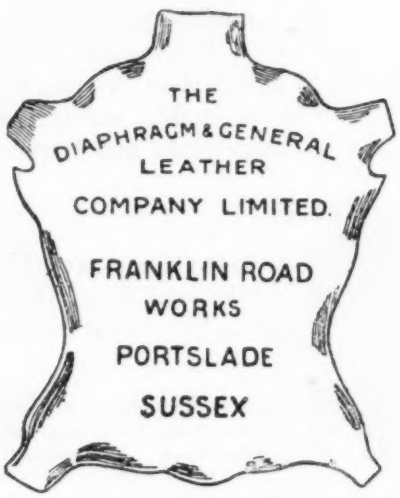

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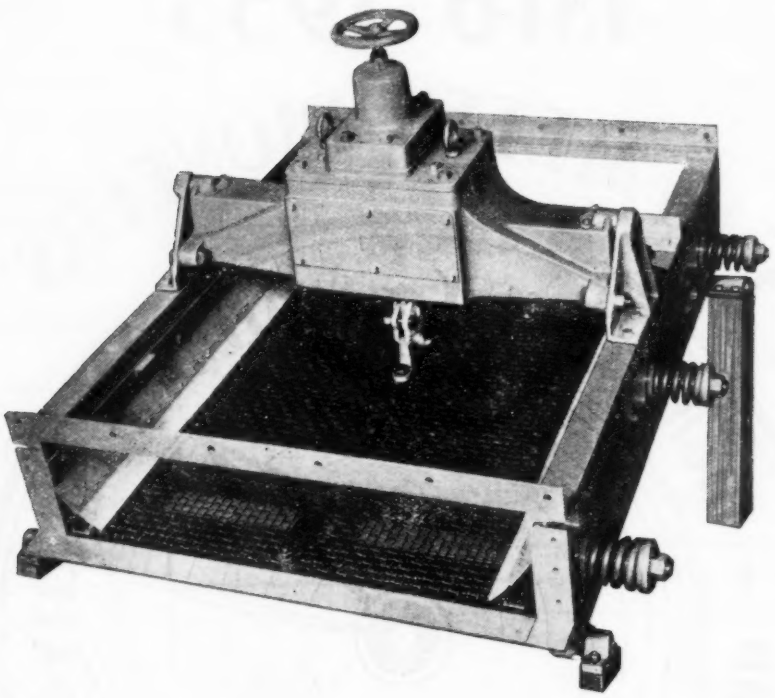

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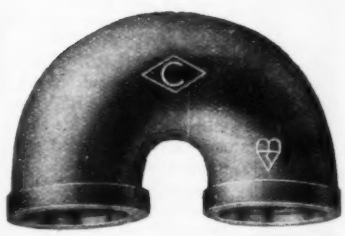

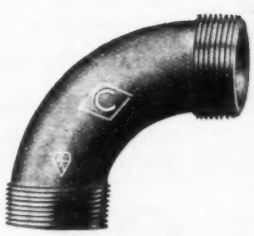

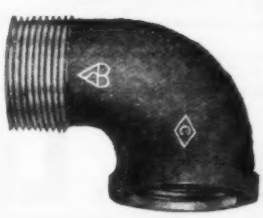

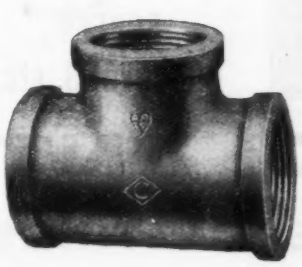

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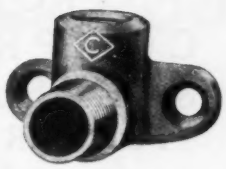

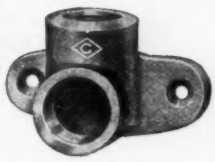

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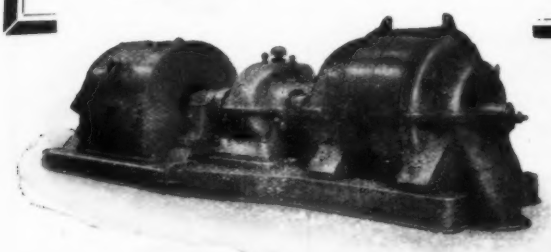

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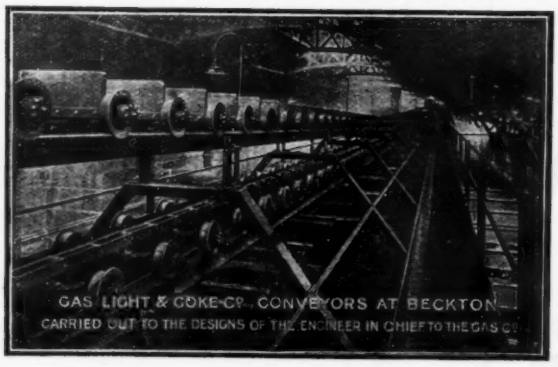

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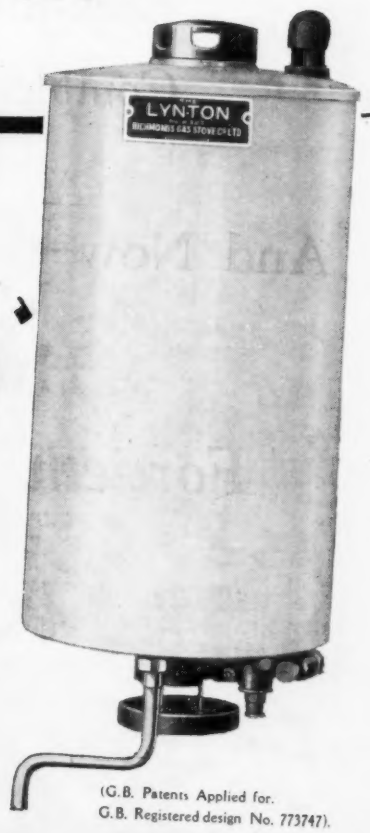

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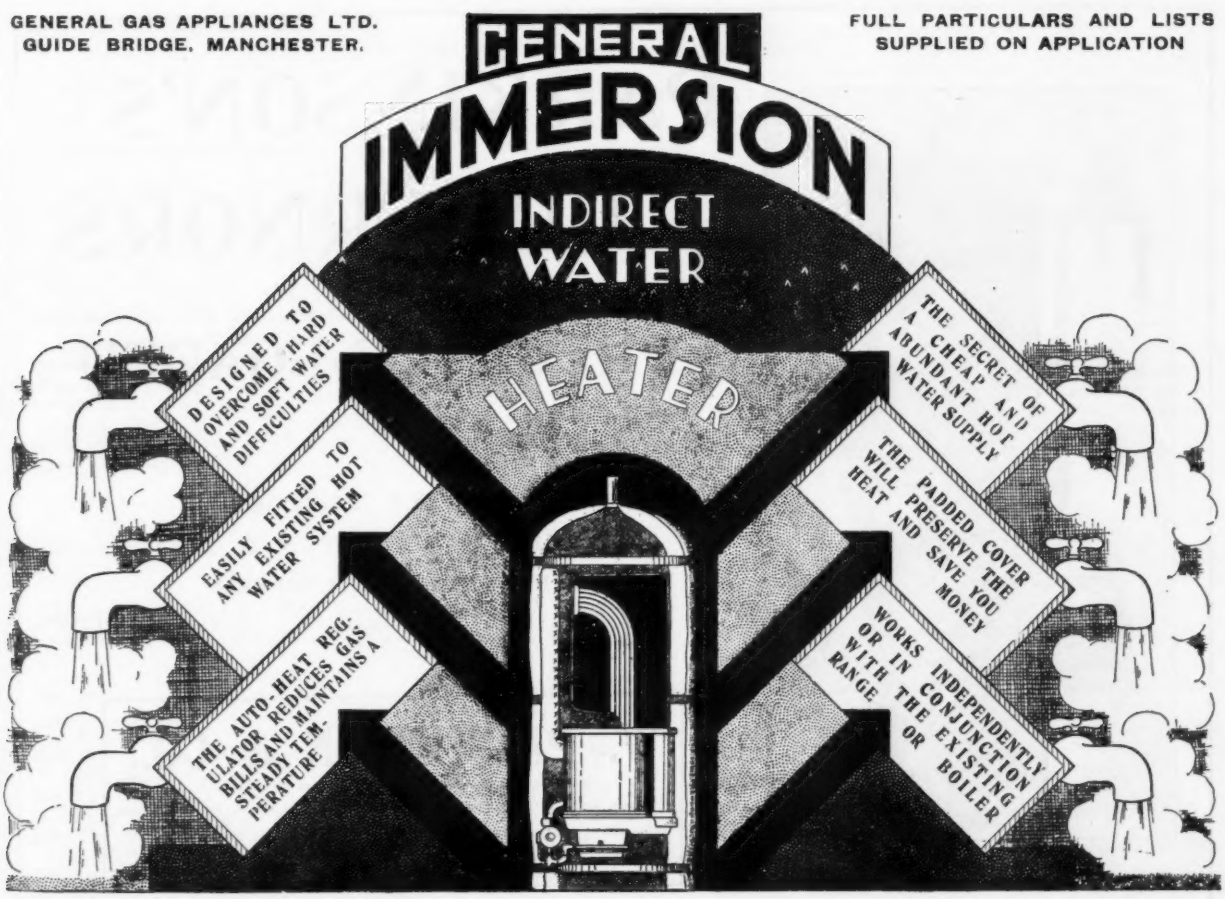
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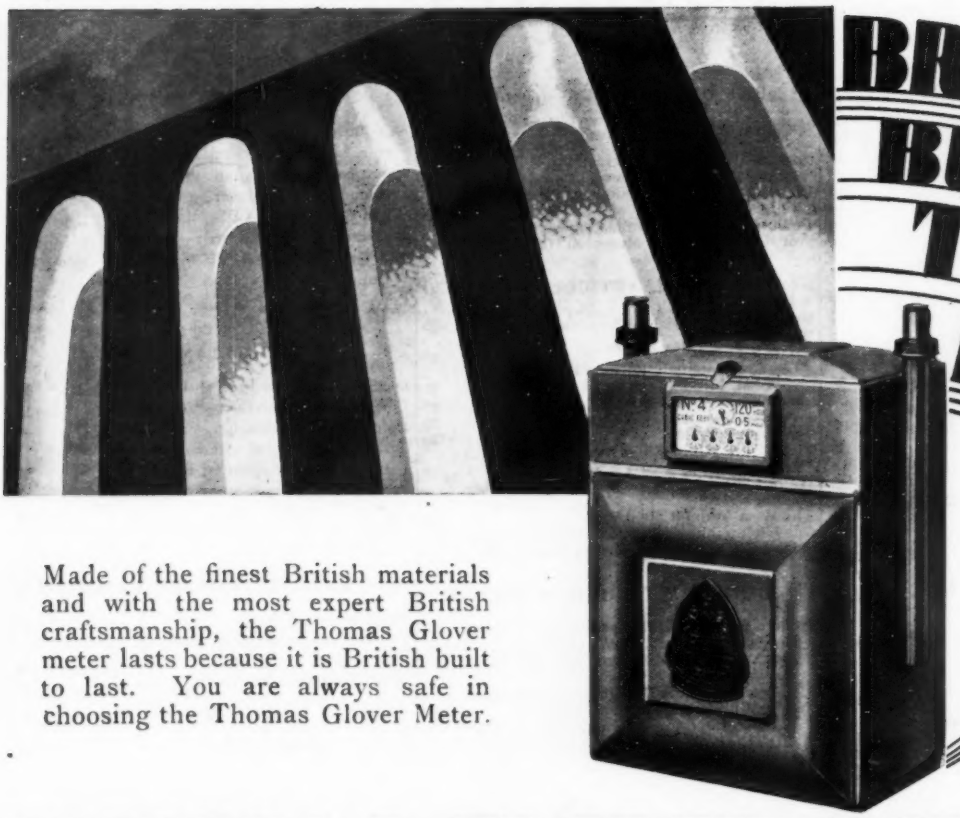

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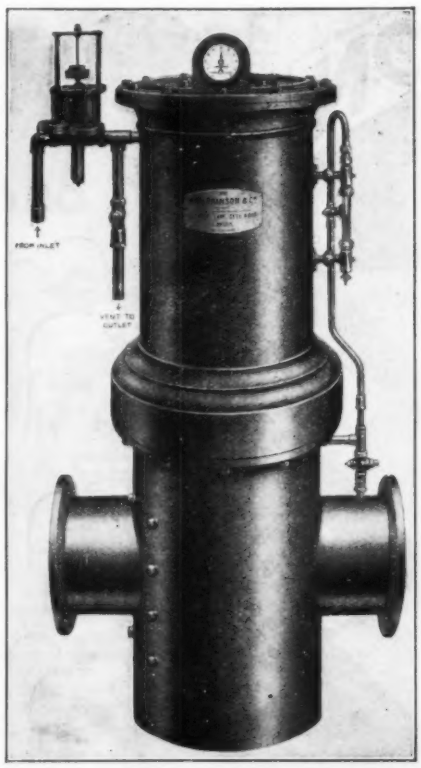

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V.201, 1933

THE GAS JOURNAL

JANUARY 4, 1933

Vol. 201. 85th Year No. 3633

A Glance at the Contents—

Gas in the Royal Mint.

An interesting article describing and illustrating the extensive applications of gas in the Royal Mint appears on p. 40.

British Sulphate of Ammonia Federation, Ltd.

Extracts are published from the Twelfth Annual Report of the British Sulphate of Ammonia Federation for the year ended June 30, 1932. [p. 53.]

Statute and Case Law of 1932.

A summary of Statute and Case Law during the past twelve months is given in so far as it affects gas undertakings and their officials. [p. 37.]

Welfare Planning for Progress.

Mr. J. Leeming Robson, of the Birkenhead Gas Department, in an article on this subject, deals with the planning on scientific lines of general working conditions. [p. 42.]

Continuous Meter Reading.

Contributing to the interesting correspondence which has taken place in our columns recently on this subject, Col. W. M. Carr, Engineer, General Manager, and Clerk to the Stretford District Gas Board, refers to the most important question as to whether the system enhances goodwill. [p. 30.]

Automatic Cut-Off for Calorimeters.

Experiences of the failure of water supply to calorimeters, resulting in their destruction, have led to the design of instruments for the purpose of cutting off the gas supply automatically as soon as the water supply fails. One of these is described by Mr. W. Masterton, of Edinburgh, in a paper before the Eastern District of the Scottish Junior Gas Association. [p. 51.]

Water Softening and Boiler Practice.

This is the subject of a paper read before the Scottish Junior Gas Association (Eastern District) by Mr. David Gardner, of Alloa. [p. 52.]

Drying Processes.

Mr. W. Hind, Industrial Gas Engineer to the City of Coventry Gas Department, describes modern gas heated equipment for various industrial drying processes. [p. 47.]

Gas Undertakings—Basic Charges.

A Joint Committee of both Houses of Parliament sat at Westminster recently to consider the application and working of the basic price system of charging by gas undertakings. [p. 44.]

Gas Calorimetry.

This authoritative and exhaustive work by Major C. G. Hyde and Mr. F. E. Mills (published by Ernest Benn, Ltd.) is reviewed by Mr. James W. Wood, M.Sc.(Tech.), A.I.C., of Leeds University. [p. 36.]

The "Turner" Retort.

A "Report of Further Tests by the Director of Fuel Research on the Turner Retort installed at the Works of the Comac Oil Company, Ltd., Coalburn, Lanarkshire," published by the Department of Scientific and Industrial Research, is reviewed by "Tambt." [p. 36.]

The West-Rotinoff Shell Pile.

Messrs. West's Rotinoff Piling and Construction Company, Ltd., have recently evolved a new piling plant for driving their special patented system of concrete shell pile for the express purpose of dealing with contracts involving a small number of piles, or driving piles under difficult conditions. [p. 43.]

TECHNOLOGY
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Forthcoming Engagements

Jan. 10.—FEDERATION OF GAS EMPLOYERS.—Meeting of Central Committee, 12.15 p.m., 28, Grosvenor Gardens, S.W. 1.

Jan. 10.—NATIONAL GAS COUNCIL.—Central Executive Board Meeting, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Jan. 12.—MIDLAND JUNIOR ASSOCIATION.—Meeting in Birmingham. Paper by Mr. H. Smith.

Jan. 14.—SCOTTISH JUNIOR ASSOCIATION.—Joint Meeting in Glasgow. Address by Mr. C. Valon Bennett.

Jan. 14.—WESTERN JUNIOR ASSOCIATION. — Meeting at Exeter. Paper by Mr. D. L. Copp.

Jan. 18.—B.C.G.A.—Meeting of Executive Committee, 28, Grosvenor Gardens, S.W. 1, 12 noon.

Jan. 19.—SOCIETY OF BRITISH GAS INDUSTRIES.—Council Meeting at 2.30 p.m.

1933 "JOURNAL" Directory.

Page 8. BLACKBURN. J. D. Ashworth appointed Engineer and General Manager.

Page 18. COXHOE. Acquired by the Spennymoor and Tudhoe Gas Company (p. 64).

Page 68. TIPTON. *Add* Sales of Gas, 224 millions. Per Cent. Industrial should be 18·1.

EDITORIAL NOTES

Dogged Determination: The Spirit for 1933

THE Lord Mayor of London (Sir Percy Greenaway) received the following reply to a New Year message sent to the King on behalf of the citizens of London:

> I have received with the greatest pleasure the New Year's message which you have sent me on behalf of the citizens of London. I warmly reciprocate, my Lord Mayor, their greetings, and sincerely thank you for the kindly reference to the Queen and my family.
>
> We have passed through a difficult and anxious year, and no one can fail to realize the heavy weight of responsibility that still faces us at home and overseas.
>
> But I am confident that the spirit of dogged determination and endurance which has been the mainspring of our efforts in the past will continue to guide our ways and inspire our hearts.
>
> I know that the City of London will, as ever, stand four-square to all the buffetings that the winds of circumstance may bring, and therefore I hopefully send my greetings to her citizens, praying that, under Divine providence, the coming year may lighten our task.
>
> GEORGE R.I.

Seeking New Fields

ON later pages to-day is a valuable practical contribution on a particular aspect of industrial gas sales—the application of gas to drying processes—and readers will find in it much information which will assist in extending the use of gas in this direction. The author, Mr. W. Hind, is Industrial Gas Engineer to the Coventry Corporation. He describes several installations which provide suggestion, and he shows how the problem of drying by gas should be tackled. The first factors to be considered are the correct temperature for the process —in which connection the author gives tables of the approximate drying temperature for a wide variety of materials—the amount of moisture to be extracted, the rate of air movement to remove this moisture, and the time required for the complete operation. Then, as to the equipment itself, the factors which make for success in use are adequate insulation, correct space for drying, re-circulation, and automatic temperature control.

All these factors are of importance, but nothing, we think, has done more good for the extension of gas for drying purposes than automatic temperature control—it is, in fact, "a necessary refinement." All manner of drying operations require a uniform temperature over a period of time—variation of temperature may often spell disaster. An example of this is cited by Mr. Hind in connection with the drying of bacon. Prior to the use of gas the method of heating was by stoves fired by solid fuel, which not only required much attention but also caused a wide fluctuation in temperature. On the other hand, gas saves all labour and, thanks to the thermostat, any anxiety regarding the finished product. High-class work produced by gas-heated equipment has a value which is hard to define in £ s. d., but goes a long way with the manufacturer in deciding upon equipment; and the use of gas and high-class work go hand in hand. This again is exemplified by the author's description of a gas-fired conveyor oven installed at a cycle works. This oven is used for drying enamelled parts, and it is particularly important that dust should be prevented from settling on the dipped enamel work, for specks of dust are magnified when baked on, and spoil the surface of the work. Gas eliminates any trouble of this kind. In the particular oven described the incoming air is passed through a filter, and spoilt work is unknown.

Mr. Hind's paper is an indication of what can be done, in face of competition from both oil and electricity, to further industrial sales, provided the case for gas is well reasoned and the equipment designed in the knowledge of the fundamentals of gaseous combustion and of the exact requirements of the manufacturer. Gaseous fuel is fully able to meet the demands of modern production methods; and in this connection the author's reference to new developments in core drying is well worthy of attention. He speaks of a continuous double strand vertical conveyor oven for core drying. With this type the cores travel four times the height of the oven. Other applications dealt with by the author typify the versatility of gas; and among these not the least interesting is a machine for drying blue prints, for it demonstrates what we have often emphasized in these columns —that in considering the use of gas in industry sight must never be lost of what may be termed minor operations. In brief, Mr. Hind's contribution is a real encouragement to those who are in any way connected with the sale of gas to the industrialist.

Sulphate of Ammonia

IT cannot be said that the Twelfth Annual Report of the Sulphate of Ammonia Federation, Ltd., for the year ended June 30, 1932, makes very cheerful reading. The consumption of nitrogen decreased by 3¾%, following a decrease of 17% in the previous year. There was, however, an increase in the consumption of sulphate of ammonia of about 10½%, obviously due to the low prices at which sulphate was offered. These prices were such as to prove unattractive to any but the most economical manufacturers, and production declined. Actually, for the first time since 1926-27, consumption exceeded production. The general price level for the coming year has been slightly raised, but, states the Report, until arrangements of a more permanent nature have been arrived at with a view to automatic regulation of production to consumption on a world basis, the nitrogen market will remain liable to the risk of violent price fluctuations. The difficulties confronting the industry may be gauged by the fact that, despite total nitrogen producing capacity in the world to-day being about 140% greater than present demand and 100% in excess of the record consumption of 1929-30, synthetic nitrogen plants are still being planned and constructed in a number of countries.

As to the home consumption of sulphate of ammonia, this showed an increase over the figures for 1930-31 of 37·6%, the total almost reaching the record level of the years at the end of the war. Here, again, this increase was due to the very low prices which obtained. On the other hand, satisfaction is to be gained from the fact that

these prices have without question created fresh and hitherto untapped goodwill for sulphate of ammonia, which should ensure a permanent increase in consumption; and the decision of the Federation to maintain all propaganda efforts and staff has been justified by the results.

A "Gas Pipe Peril"

GLANCING through one of the popular morning newspapers a day or two ago, we were interested in a heading extending across two columns which read: "Gas Pipe Peril in a Blaze." This was elaborated by smaller lines beneath: "Firemen Have to Climb to Roof to Enter Offices." The outbreak (in the Broadway, Wimbledon) was not, it would seem, a serious one, but the firemen found it impossible to force their way up the narrow staircase between the first and second floors, and they had to climb to the roof and enter through a skylight. "An escape of gas from several burst pipes made the brigade's task difficult, but they succeeded in confining the outbreak to the second and third floors."

The report indicates that the heading did not err on the side of moderation, and we think the Gas Industry would be justified in expecting that, in drawing the attention of their readers to current events, newspapers should be careful not to allow enthusiasm to outrun discretion in the matter of head-lines. The public is supposed to thrive on excitement nowadays, but in the present case there would seem to have been hardly sufficient material out of which to derive even the mildest genuine sensation. What a prosaic ending it would have made had someone turned off the gas at the main or the meter. Perhaps that is what happened.

Showing a Decrease in Rates

THERE is welcome news contained in the 48th annual statement of rates levied in various towns of England and Wales in 1932-33 (compiled by Mr. W. Allison Davies, Borough Treasurer of Preston), in that there is some decrease shown on the averages quoted twelve months ago. Not a great deal, perhaps; but an earnest, it may be hoped, of better things to come. It is essential that the burden of rating and taxation be lightened, which fact makes one anxiously scan returns of the nature of that prepared by Mr. Allison Davies.

Statistics are included now from over 300 places, so that the figures may be regarded as fully representative. They show that, in the case of 84 County Boroughs, the total rates levied for 1932-33, at about 12s. 9½d. in the pound, averaged 2d. less than a year ago. In 114 Boroughs, the average is 11s. 11¼d., which is nearly 7d. less than for 1931-32. The average for 105 Urban Districts, at about 12s. 1½d., exhibits a drop of about 5½d. in the pound. The results naturally differ widely in various parts of the country, and decreases of any kind are by no means universal. Among the County Boroughs, for instance, Merthyr Tydfil shows an increase in total rates levied from 25s. 4d. in 1931-32 to 27s. 6d. on the present occasion. With the 28 Metropolitan Boroughs, though there are two cases of an increase of 6d., the tendency on the whole has been in a downward direction. Poplar is the only one among them which now figures at 16s. or more in the pound.

Prepayment Meter Law

A CHARGE heard recently at the Dublin District Court brings back to mind the time when cases connected with thefts from, and damage to, prepayment meters figured largely among the "Legal Intelligence" in the "JOURNAL." There were also numerous cases reported in which discs were used instead of coins to operate these meters. In different instances the circumstances varied, so that one decision might not be applicable in another case, but eventually a great deal of trouble was obviated by specific agreements drawn up by gas undertakings for signature by the prepayment consumers. These agreements, however, were not always the same. In fact, in the Seventh Edition of "Michael and Will on the Law Relating to Gas and Water," published in 1924, it is remarked that "the relations between the consumer and a gas company in regard to prepayment meters depend entirely on the terms of the agreement signed by the consumer. These agreements vary. This may explain the fact of the seeming contradictions."

In the Dublin case, a man was charged with stealing money from a gas meter in his own house, and damaging the meter by breaking the lock. Informations on the larceny charge were, however, refused, on the ground that "in a case of this kind the money did not become the property of the Gas Company until they had collected it." It was argued that, like other traders, gas undertakings took risks, and "as the defendant had put the money in the meter, it remained his property until it was collected by the Gas Company, who then acquired an ownership in it." For damaging the meter, the defendant had to enter into a bond. We do not know whether there was any agreement between the undertaking and the consumer in the instance referred to, but the decision is at variance with some reported in the "JOURNAL" during the years 1927 to 1929. There may be some explanation associated with legal affairs in the Irish Free State to account for this difference.

At Dundee Sheriff Court a sentence of 40 days' imprisonment was imposed on William Kenny Mitchell for having broken open a gas meter in his house and stolen from it 16s. 9d.; while at Dumbarton Police Court, when Mary M'Learie was put on probation for three months for having stolen 19s. from a gas meter in her house, it was pointed out that persons in accused's district had discovered how to open the padlocks with safety pins. She had used a knitting needle for the purpose. At Shrewsbury Police Court, William Henry Davies was charged with stealing 9s. 7d. from a gas meter in his house, and also with damaging the padlock of the meter. Defendant pleaded guilty, and was sentenced to six weeks' imprisonment with hard labour.

Subsequently, at Sheffield, William Cunningham was sentenced to one month's imprisonment with hard labour, on a charge of stealing 12s. 10d. from a gas meter at his residence. At Chesterfield, Leslie Rowe was accused of stealing £1 1s. 3d. from a gas meter at his home. It was alleged that defendant opened the prepayment meter lock with a hairpin. The lock was partially broken, and damage of 2s. 6d. was claimed. The Bench fined defendant £1, and ordered him to refund the amount of money he had stolen and pay for the damage. At Dunfermline Sheriff Court, Euphemia Husband was fined 30s. with the alternative of 15 days' imprisonment, for having stolen the sum of £2 5s. 3d. from a gas meter in her house by opening it with a false key.

There is nothing ambiguous about these cases, which, on the face of things, are in accord with the term "*prepayment* meter."

Gas Makes Money

EVERY progressive industrialist knows to his saving that gas makes money, but not every industrialist may be aware of the extent to which gaseous heat is applied in the actual production of coinage. A glimpse into this use of gas is given in our columns to-day, the source of the illustrated contribution being the "Co-Partnership Herald" of the Commercial Gas Company, in whose area of supply the Royal Mint is situated. The Mint is, in fact, one of the Company's largest and most important consumers, the average annual consumption of gas being approximately 72 million c.ft.

The article in question gives an idea of the high efficiency of the organization at the Mint, and there is no doubt that in the maintenance of this efficiency gas plays a major part. In the manufacture of coins, heat is required in several processes—the melting of the silver and the addition of the necessary alloys, bronze, copper, and nickel; the malleablizing process; the annealing operation; and finally the drying of the finished coins. Throughout gas is the fuel which satisfies requirements in the best possible way.

PERSONAL

SIR FRANCIS GOODENOUGH.

We are glad to be able to report that Sir Francis Goodenough's operation on Thursday last was successful, and that his surgeon and physician regard his condition as satisfactory.

As is only to be expected following an operation of the serious nature of that undergone by Sir Francis, he has been suffering considerable discomfort, and has been getting little natural rest.

We hope that next week we shall be able to report that Sir Francis has come successfully through the most critical stage of his illness, and that he is safely on the road to recovery.

* * *

Mr. JOHN MEADE FALKNER, M.A., who died recently at the age of 74, left gross estate valued at £215,524, with net personalty of £210,665. Mr. Falkner was a Director of the Newcastle-upon-Tyne and Gateshead Gas Company, Chairman of Sir W. G. Armstrong Whitworth & Co., and also on the Boards of other well-known concerns in the North.

* * *

Mr. THOMAS COLEMAN, Senior Cashier of the Plymouth and Stonehouse Gas Company, retired on Dec. 31, after forty-five years' service. He joined the Company as a junior clerk in 1888 and has served under three secretaries and four chairmen. On Dec. 31 the staff of the Company gathered at the Offices to present Mr. Coleman with a farewell gift, which took the form of a wireless set. The presentation was made by Mr. C. H. Bolton, Secretary of the Company.

* * *

Mr. G. C. MERCER has been elected Chairman of the Maidstone Gas Company in succession to the late Mr. E. Hills.

* * *

The deep sympathy of all in the Gas Industry will be extended to Mr. W. C. CHAPMAN, Engineer and Manager to the Boston Gas Light and Coke Company, and Hon. Secretary of the Eastern Counties Gas Managers' Association, who on Friday last suffered a threefold bereavement. His wife, mother, and sister were killed and an employee of the gas-works named Thomas Martin was severely injured in a motor smash on the main Norwich and Dereham road at Honingham. The four were in a coupé car being driven by Martin on their way from Boston to Great Yarmouth, when the car came into collision with an omnibus. The vehicles came into collision almost head on and the car was smashed, the engine being driven back into the front seats and the front seats into the rear.

OBITUARY

J. W. WILSON.

As was briefly announced in the "JOURNAL" last week, Mr. James William Wilson, a Director of Messrs. Wilsons & Mathiesons, Ltd., of Armley, Leeds, died on Dec. 24 in his 76th year. Mr. Wilson was the second son of the late Mr. Charles Wilson, the founder of the firm of Messrs. Charles Wilson & Sons, manufacturers of the first gas fire, which had been invented by the elder brother, Mr. Henry Wilson.

The amalgamation with Mr. William Mathieson in 1889 formed the firm of Messrs. Wilsons & Mathiesons, Ltd., which joined forces with Radiation Ltd. in 1920, and along with the Chairman, Mr. William Mathieson, Senior, Mr. Wilson represented his Company on the board of that firm until about five years ago, when he resigned.

Deceased was well known throughout the whole Gas Industry of Great Britain, and had a very wide circle of friends within the Industry. He was keenly interested in music and assisted in the work of the Leeds Philharmonic Society. He took part in musical festivals at Leeds, Hereford, and Worcester, and was associated with the local amateur operatic society.

* * *

W. W. DUFFIELD.

The death occurred on Dec. 23, in his 80th year, of Mr. Walter William Duffield, at Braintree, Essex. Mr. Duffield was a Fellow of the Chemical Society, and was the City of London's Gas Examiner for many years, having been in the service of the Corporation of London for over half a century.

Born in Chelsea, Mr. Duffield spent his early years in the United States. On returning to this country in 1874, he obtained his chemical training under Charles Heisch, Professor of Chemistry at the Middlesex Hospital, who in 1868 succeeded Dr. Letheby as Gas Examiner for the City. Dr. Letheby was the first official Gas Examiner to the Corporation, and became Chief Gas Examiner under the Board of Trade in 1868. Mr. Duffield acted as assistant to Prof. Heisch until the latter's death in 1890. Prof. Lewes succeeded Prof. Heisch as City Gas Examiner, and from 1891 to 1915 Mr. Duffield acted as his Chief Assistant and Senior Examiner. On the death of Prof. Lewes in 1915, Mr. Duffield succeeded to the position of Gas Examiner, and had charge of the office and testing places under the the control of the Corporation.

Mr. Duffield was greatly interested in sport, and his experiences in that way were many and varied. He was well known as an angler, and he was an authority on dogs.

* * *

The death has occurred, at the age of fifty-four, of Mr. W. D. EDDY, who was Secretary of the Tavistock Lighting, Coal and Coke Company, Ltd., for seventeen years until 1927, when, on the opening of the Company's premises in West Street, he became Salesman-Accountant.

CORRESPONDENCE

Continuous Meter Reading

SIR,—I have perused with interest the correspondence which has taken place on Continuous Meter Reading and Billing for Quarterly Gas Accounts. Mr. Carmichael raises the most important question when he asks "Does it enhance goodwill?"

In introducing continuous billing at Stretford, we were careful to spread the change-over over as long a period as possible. For example, prior to the introduction, the quarterly reading of ordinary meters occupied a period of four weeks, which period commenced three weeks before the quarter day, and finished one week after. The quarterly readings were gradually extended over a period of six quarters until the readings became continuous—that is to say, the normal quarter of four weeks was extended to six weeks by commencing a week earlier and finishing a week later. In the next quarter it became seven weeks by commencing a week earlier; in the following three quarters the period was extended to nine, eleven, and thirteen weeks respectively by commencing in each quarter a week earlier and finishing a week later until the full thirteen weeks' period was covered in continuous reading. No serious complaints arose at all in consequence of this gradual alteration, although consumers inquired why the meter was not read nearer the quarter day; they were, however, generally satisfied with the explanation.

With the introduction of machine billing, however, some objections were raised by consumers, as the machine does not print the date on which the meter reading was taken, and it has been found necessary to stamp this date on all accounts before the bill is made out in the machine. There have also been minor complaints from consumers with reference to the coding of charges, which is a necessary part of a machine-made bill, and considerable explanation has been necessary on the part of inspectors and rentals staff.

It cannot be stated that continuous meter reading or machine billing is any advantage so far as goodwill is concerned. I am, however, satisfied that such minor difficulties as have arisen will disappear within twelve months of the commencement of operation of machine billing.

Yours, &c.,
W. M. CARR,
Engineer, General Manager, and Clerk.

Stretford and District Gas Board,
Stretford,
Dec. 28, 1932.

THE . . . GAS JOURNAL CALENDAR & DIRECTORY, 1933*

Reviewed by H. M. Spiers, M.A., B.Sc., F.I.C.

The function of a book-review is, generally, to draw the attention of a circle of potential purchasers to the appearance of a new book, and to provide them with an indication as to the scope of the book and its merits or defects. Those who have read the review are then in a position to decide whether to buy the volume or not. Reviews are, therefore, important factors in connection with sales, and can often make or mar the success of a book. The present review is exceptional in that the volume with which it is concerned cannot be purchased, since it represents a gift made by the publishers of the "GAS JOURNAL" to their annual subscribers. There may be a few workers in the Gas Industry who do not subscribe to the "JOURNAL," and are thus, to their great loss, unable to secure a copy of the present issue of the Calendar and Directory; but they can take steps to ensure that they will, in future, not be so unfortunately situated.

We are told not to look a gift-horse in the mouth—presumably lest its defects become too apparent. The Calendar and Directory will, however, bear the closest scrutiny, which indeed serves but to reveal its wide scope and sphere of usefulness. Books of reference can undeniably be valuable assets, but it is often the case that full use is not made of them, merely because their possessors have not taken the very necessary step of familiarizing themselves with their contents, and therefore do not know just where to turn when confronted with a problem on which immediate guidance is desired or where to look for a specific piece of information. Recipients of the Calendar and Directory will do well to spend an hour in a comfortable armchair browsing over the volume, and they will find themselves amply repaid for their trouble during the forthcoming year.

It is by no means easy to describe briefly the contents of this yearbook since they cover so many fields and represent, in fact, a compendium of useful information for the director, manager, engineer, chemist, secretary, store-keeper, and carbonizing foreman of a gas-works. The volume is divided into six main sections—Almanack, Trade Section, Directory, Memoranda, Diary, and Advertisements. These are separated from each other by tinted inset sheets bearing the announcements of a few prominent firms, and these insets make it very easy to turn at once to the section of immediate interest.

The Almanack commences with a monthly calendar for 1933, which is followed by a page giving the dates which have been fixed for some of the more important events of the year, including meetings of the National Gas Council, British Commercial Gas Association, Society of British Gas Industries, and Institution of Gas Engineers, as well as for sporting events of national interest. This very useful feature should enable secretaries to choose, for their own functions, dates which do not clash with the Derby or any other fixture which no one likes to be compelled to miss. Next comes an alphabetical list of many important contributions to gas literature during the year to Nov. 30 last, with references to the pages of the "JOURNAL" in which they were published. One cannot conceive of any better form which could have been adopted for this new feature, and readers might well mark off, without delay, a number of the items of special interest to them and take an early opportunity of refreshing their memory by consulting the original articles. Times of sunrise and sunset at Greenwich are tabulated for each Monday of the year, and, by the use of a correction table and a map, the approximate time of sunrise and sunset may be obtained for any place in the British Isles at any date. This information is supplemented by tables of the moon's phases and of lighting-up times. The convenient form in which these tables are drawn up should render them very helpful in connection with public lighting.

The Directory gives, first, the locality, ownership, telephone number, names of officers, capital, type of plant, annual make and sales (including the percentage of industrial gas), number of consumers (both domestic and industrial), tonnage of coal carbonized and gallonage of oil gasified, coke make, quantity of coke for sale, declared calorific value, and selling price of gas for all the undertakings in the British Isles; then particulars of colonial and other British owned undertakings; then information covering coke-oven plants in Great Britain, including the number of ovens and their type in each case. This is followed by notes on the Gas and Allied Organizations of Great Britain and Ireland, including the Senior and Junior Gas Associations, by a list of Public Lighting Superintendents, and by an alphabetical list of the personnel of the United Kingdom undertakings. The work involved in keeping this mass of information up-to-date must be heavy, in view of the large number of changes which have to be recorded each year.

The Directory is completed by a new section which cannot fail to be appreciated by firms who have to plan-out journeys for their representatives. It consists of a County Classification of all the gas undertakings, amplified by a note of their annual make and a reference to the page of the Directory on which the full particulars of each undertaking are given.

The Memoranda Section has again been entrusted to the able hands of Col. W. M. Carr, who, while retaining the same general style as was initiated when the Calendar and Directory assumed its present form in 1931, has taken care that due recognition shall be given to recent developments. The information presented is sectionalized under the headings of gas industry statistics, legislation, taxation notes (redrafted by Mr. H. T. Seymour), coal and analysis, carbonization, coke and analysis, condensation, tar extraction, exhausters, washers and scrubbers, purification, station meters, dehydration of gas, manufacturing costs, benzole recovery, tar distillation, works tests, coal gas and other gaseous fuels, calorimetry, pyrometry, gasholders, electrical plant on gas-works, distribution, general information, and tables. There is an adequate index revealing at a glance the contents of each of these miniature treatises on the several aspects of gas-works practice. The information given has been well chosen, and may be accepted as reliable. The inevitable exception is the reference to the mean specific heat of methane between 0° and 2000° C., for which, of course, a value cannot be given, since methane is decomposed far below the latter temperature.

A few examples may be quoted to demonstrate how up-to-date the information is. A synopsis of the Gas Undertakings Act, 1932, is included in the legislation section. The revised West steaming chart is reproduced, and reference is made to the high thermal yields of gas obtained by the Joint Research Committee in their tests on the Woodall-Duckham intermittent chamber installation at Croydon. An abstract appears of the draft British Standard Specification for the sampling and analysis of coke. The section on washers and scrubbers includes notes on recent developments in the manufacture of ammonia liquor, whereby much of the loss incurred in the disposal of liquor may be obviated. In connection with purification, reference is made to the introduction of deep boxes and to the tower system. Under station meters, the Brandl-Marischka meter, particularly suitable for high-capacity consumers' meters and sale of gas in bulk, is described. The section devoted to benzole recovery has been considerably amplified—a welcome feature in view of the widespread interest now displayed in this subject—and the 1932 N.B.A. specification for motor benzole is reproduced.

In connection with the maintenance of holders, an abstract is given of the recommendations contained in the First Report of the Institution of Gas Engineers Gasholder Sub-Committee, 1932. This report follows very closely the schedule recommended in previous issues of the Calendar and Directory. The conclusion to be drawn from this is that the Memoranda are not merely up-to-date but that they provide, occasionally, a peep into the future.

The sections dealing with water gas and with the determination of sulphur in spent oxide have been revised. It is noted that the typical analysis of a good gas coke is given as H_2O 4·0%, ash 8·0%; but it is to be feared that a great deal of the coke sold does not conform to this standard.

The volume concludes with a diary (one week to a page) and an advertisement section. A classified buyers' guide is

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also included, providing information covering reliable sources for the supply of almost every gas industry accessory from a gas mantle to a gasholder. One wonders, however, whether the old problem of unaccounted-for gas has disappeared, since no reference can be found to gas leak detectors.

From the above résumé of the contents of this indispensable annual, it will be apparent that the Publishers have, once again, done great service to the Gas Industry in presenting its members with such an acceptable gift. Dared one be like Oliver Twist, one might venture to suggest an increase in its already wide scope by the inclusion of a few additional items in subsequent editions. These might comprise sections on water treatment (a subject of primary importance, too often neglected), tar distillation plant, dry quenching and coke screening plant, and automatic control appliances, while a few notes would not be out of place on the evils of over-cracked tars and on methods of dealing with occasional, and what may be termed pathological, troubles in gas-works practice—*e.g.*, difficultly resolvable emulsions of tar and liquor.

The writer has, in the past, found constant occasion to refer to the "JOURNAL" Calendar and Directory, and anticipates finding it as useful as ever in the coming year.

THE NEWS OF THE WEEK

The Recent Offer by the South-Eastern Gas Corporation, Ltd., to holders of the ordinary stock of the Folkestone Gas and Coke Company has been accepted by more than 90% of the stockholders.

The Sales of Gas by the Compagnie du Gaz de la Region de Charleroi, Belgium, during the financial year ended September last amounted to approximately 427 million c.ft.—an increase of 9¼%.

A Scheme for Improved Lighting of the principal streets in the town has been submitted to the Bilston Urban Council, who agreed to ask the Bilston Gas Company to contribute towards the cost of installation.

A Globe-Shaped Gasholder has recently been completed at the municipal gas-works at Prague, Czecho-Slovakia. It weighs 270 tons, and has a diameter of 65½ ft., giving a capacity, with gas under a pressure of four atmospheres, of 443,500 c.ft.

An Increase of 7 million c.ft., or 1·8%, on the same period of 1931, is recorded by the Darlington Gas Committee for the eight months ended November last. Mr. A. E. Ruffhead, the Corporation Gas Engineer, has been authorized to extend the mains to supply Neasham.

Barter in the Gas Industry is reported to have recently been inaugurated between Austria and Hungary—namely, exchanging coal for pigs and lard! Thus, it is stated, an arrangement has been made between the municipal gas authorities of Budapest and the collieries in the Ostrau (Austria) mining area whereby instead of cash being paid for gas coal supplies, payment will be made by the bartering of an equivalent amount in the form of pigs and lard.

A Co. Durham Amalgamation.—The Spennymoor and Tudhoe Gas Company have taken over Coxhoe Gas Company, which has gone into voluntary liquidation, after being in existence about 70 years, and propose supplying the Coxhoe district with gas direct from their Spennymoor Works. The consumers will benefit from the change, the price per 1000 c.ft. for ordinary meters being reduced from 5s. 10d. to 4s., while slot meter users will receive 16 c.ft. for 1d., instead of 10 c.ft. as at present.

Penrith's New Gasholder was inaugurated at a meeting of the Gas Committee and members of the Council at the works, when details of the structure and capacity of the holder were given by the Gas Engineer and Manager, Mr. J. Corrigan, and an inspection was made. Mr. F. Stephenson (Chairman of the Council) was invited to open the valves and allow the gas from the new holder to enter the town mains. The Chairman of the Gas Committee, Mr. Newton, was presented with a silver cigarette case to commemorate the occasion.

Gas Production in Sweden.—The 1932 Year Book of the Union of Swedish Gas-Works, which has recently been published, shows that at the end of 1931 there were thirty-seven gas undertakings in Sweden, with a total of about 1220 miles of distribution mains and an aggregate of 386,048 meters in use. The production of gas in the country during 1931 reached a total of approximately 6,458,967,000 c.ft.—an advance of 5·39% over the preceding year. The aggregate consumption of coal is given as 508,904 tons—equal to approximately 12,700 c.ft. of gas per ton.

Institution of Gas Engineers.

Members of the Institution of Gas Engineers are invited by the Illuminating Engineering Society to participate in a visit which the Society has arranged—by kind permission of the Gas Light and Coke Company—to the Watson House Laboratories, Nine Elms Lane, S.W. 8, on Tuesday, Jan. 10, at 7 p.m.

Mr. C. A. Masterman will deliver an address describing the work of the Laboratories, with particular reference to some recent developments in gas lighting, and the tour of the Laboratories and workshops will commence at 7.15 p.m.

Light refreshments will be provided at 6.30 p.m.

Tickets of admission may be obtained from the Secretary of the Institution, 28, Grosvenor Gardens, S.W. 1.

Members of the Institution are invited by the Council of the Institute of Fuel to attend the meeting of the Institute at the Chemical Society's Rooms, Burlington House, Piccadilly, W. 1, on Wednesday, Jan. 11, at 6 p.m., when a paper on "The Manufacture of Organic Products from Coke-Oven Gas," by T. E. Oesterreith and G. Descamps, will be presented and discussed.

Tickets of admission are not required.

Advance copies of the paper may be obtained from the Secretary of the Institution of Gas Engineers.

Gas Publicity in Sheffield.

That the Gas Industry in the Sheffield district is thoroughly alive to the present-day needs and opportunities of both industry and the home is emphasized by a glance through the pages of a recently published Trade Supplement to the "Sheffield Daily Telegraph."

An interesting and comprehensive article referred to the developments in the use of gas in Sheffield and district, and gave details of the work carried on in the new research department of the Sheffield Gas Company at their Effingham Street Works. New physical, chemical, and metallurgical laboratories, it is stated, in charge of a fully qualified chemist, have been equipped and are now at the disposal of Sheffield manufacturers for carrying out research work on materials and processes in connection with the Sheffield trades.

The equipment is replete with the latest apparatus for making and accurately observing the results of any tests and includes a metallographical apparatus of the most modern type, which projects magnified structures of any material on a screen so that they can be instantly examined or photographed at will. Failure of material through faulty composition, incorrect heat treatment, and fatigue stresses, &c., can be fully and scientifically examined and investigated, and complete examination of the thermal treatment of metal or materials can now be made.

These laboratories already have been of valuable assistance to manufacturers in overcoming one of the difficulties which, up to the present, has been considered unsolvable.

Mr. R. A. Mott, M.Sc., F.I.C., of the Department of Fuel Technology, Sheffield University, dealt at some length with the subject of compressed gas in motor vehicles, analyzing the safety factors and economy of the system, while a photograph showed one of the motor 'buses of the Chesterfield

Corporation equipped with six high-pressure cylinders and running on coke oven gas.

Sir Francis Goodenough, C.B.E., in a contribution on the "Back to Coal" movement, referred to the important part that gas can play, and issued a note of warning against the danger of the movement falling into a morass of muddled and reactionary thinking. "Back from the tanker to the truck, by all means," he says; "but send the truck to the gas-works, in the interests of economy, efficiency, and public health."

An Industrial Supplement published by the Sheffield "Daily Independent" also contained a comprehensive summary of the Sheffield Gas Company's activities, and included a photograph of the new laboratory adjoining the Company's furnace room. Progress in the use of gas for the street (there are over 16,000 public gas lamps in use in Sheffield) has been well sustained during the past year, it was stated, and it becomes increasingly popular in domestic as well as industrial circles.

Smoke Abatement.

The National Smoke Abatement Society has sent to 130 local authorities a memorandum suggesting the establishment of further Regional Advisory Committees similar to those which have for some time operated successfully in Greater London, the Midlands, the West Riding of Yorkshire, and the Manchester Districts.

It is suggested that local authorities should co-operate to form five new areas for Tyneside, Tees-side, North-East Lancashire, Merseyside and South-West Lancashire, and the Potteries.

The existing Advisory Committees, which were formed with the assistance of the Ministry of Health, are endeavouring to secure greater uniformity in the administration of the law relating to the emission of smoke. Even greater importance, however, is attached to the preventive than to the punitive side of the work.

The Committees already in operation include among their activities the standardization of methods of taking observations, the encouragement of training courses for stokers and the issuing of certificates for efficiency, the encouragement of better relations between local authorities and manufacturers, and the collection of all useful data respecting the latest developments in smoke prevention apparatus and appliances.

The Society emphasizes that the cost of such Advisory Committees is trifling, two guineas being the maximum annual subscription paid by any of the constituent local authorities of the existing Committees.

THE NEWS—continued.

Gas Meter Money.

Not Company's Property Until Collected.

According to the "Irish Independent," when John Murphy, a Dublin ice cream merchant, was charged with stealing 9s. 2d. from a gas meter in his kitchen and with damaging the meter by breaking the lock, Mr. Little, D.J., in refusing information on the larceny charge, said he had ascertained from the Registrar, that in a case of this kind the money did not become the property of the gas undertaking until they had collected it.

Like other traders, said Mr. Little, they took risks, and as the defendant had put the money in the meter it remained his property until it was collected by the Gas Company, who then acquired an ownership in it.

For damaging the meter, the defendant would have to enter into a bond to be of good behaviour, and would have to compensate the Gas Company for the damage. The defendant entered into the bond.

Wandsworth Company's Rapid Development.

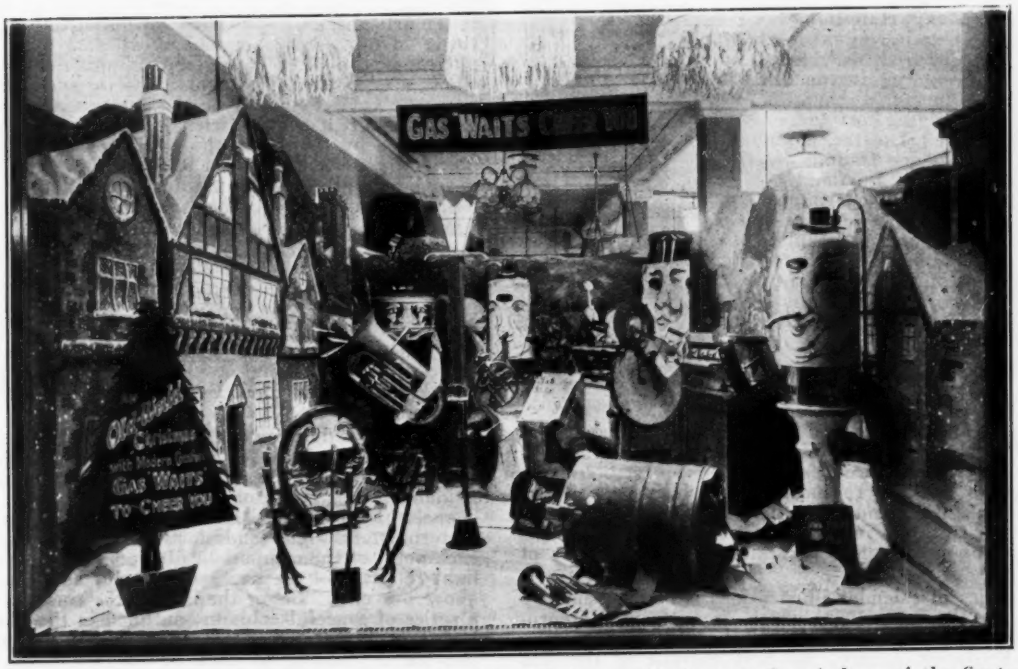
The continual and rapid development of the Wandsworth and District Gas Company was referred to in the "Potential Investments" column of a recent issue of the "Financial Times."

The Company, it was stated, was incorporated in 1912 as an amalgamation of the old-established Wandsworth and Putney, Mitcham and Wimbledon, and Epsom and Ewell undertakings. In 1930 the undertaking of the Kingston-upon-Thames Gas Company was acquired, and that of the Sutton Gas Company in 1931.

Operations have rapidly increased, and further considerable expansion must occur as the development of the several areas proceeds. It is of interest that the Company owns a fleet of four steamers, with an aggregate carrying capacity of about 7400 tons, which greatly contribute to the economical working of the undertaking.

Throughout the whole of the limits of supply, the basic price of gas is 11d. per therm. Since 1926, sales of gas have risen without break from 22¾ million therms to about 26½ million in 1931, while in the same period the number of consumers has increased from 121,606 to 147,261. Since the beginning of 1930, when the various stocks were consolidated into one class, the dividend paid has been at the rate of 7% per annum, or 2% above the basic rate, down to June 30, 1932. On Dec. 31 last the reserve fund stood at £42,629, and the special purposes fund at £67,283.

A Christmas Window Display



Our photograph is of one of the ingenious and enterprising Christmas Displays in the windows of the Central Showrooms of the Bournemouth Gas and Water Company in Old Christchurch Road, Bournemouth.

THE NEWS—continued.

Lectures on Illumination.

With the co-operation of the National Illumination Committee and the Illuminating Engineering Society the Polytechnic, Regent Street, has arranged a series of lectures on illumination. The lectures will be held on Wednesdays, at 6 p.m., and among the lecturers are Mr. F. C. Smith (Gas Light and Coke Company), who will discuss "Gas Lamps and their Applications," and Mr. J. F. Colquhoun (Public Lighting Engineer, Sheffield), whose subject will be "Public Lighting."

The fee for the course of ten lectures is £1 1s., while that for a single lecture is 5s. Firms taking not less than six tickets for the use of their employees can obtain them at half fees. Application should be made to the Director of Education, The Polytechnic, 309, Regent Street, W. 1.

London Firm's Extension.

A noteworthy addition to the number of works establishments designed on modern lines which are springing up around London is the spacious new building recently built and equipped at Gunnersbury by United Water Softeners, Ltd., water purification engineers, of Aldwych House, W.C. 2, with the object of providing increased and more convenient accommodation for their growing technical and commercial staffs.

Permutit House, as the new building has been named, stands at the junction of the Great West Road with Chiswick High Road and Gunnersbury Avenue, a few minutes' walk from Kew Bridge. It comprises completely equipped analytical and research laboratories, devoted to the examination of water samples and the elucidation of treatment problems; an experimental and testing station; large well-lighted drawing offices; an assembly depôt for Permutit domestic water softeners destined for installation in the South of England; and a handsome suite of offices for the technical, sales, and advertising departments.

United Water Softener's Registered Offices, Showroom, and Domestic Water Softener Department remain at Aldwych House as heretofore, and manufacture of their water purification plants will be carried on as at present at the Company's Lightpill Iron Works, Stroud.

Seventh List of Bookings for Film "Tar."

The following provisional bookings have been made for the film of the British Road Tar Association, which will be shown for three days at each theatre:

Jan. 5.—Cinema, Ware.
,, ,, Criterion, Gosport.
,, ,, Picture House, Westerhope, Newcastle-on-Tyne.
,, 9.—Roxy, Hamilton.
,, ,, Crown, Newcastle-on-Tyne.
,, 12.—Picture Theatre, Askern.
,, 16.—Empire, Murton, Durham.
,, 23.—Cinema, Birchington.
,, ,, Palace, Portland.
,, ,, New Theatre, Brymbo.
,, 25.—Cinema, Raunds.
,, ,, Palace, Portland.
,, 30.—Guildhall, Carnarvon.
Feb. 6.—Carlton, Westgate-on-Sea.
,, ,, Olympia, Blackhill.
,, 9.—Picturedrome, Petworth.
,, 13.—Empire, Portsmouth.
,, ,, Lyric, Ardrossan.
,, 16.—Picture House, Paignton.

"Pioneer" Gas Apparatus.

The useful and artistic desk calendars which have been presented by Messrs. W. C. Holmes & Co., Ltd., of Huddersfield, during the past two years to their business friends, must now be familiar to most in the Industry. These combined with the calendar for the month exceedingly well executed illustrations, reproduced from an artist's drawings, based upon authentic portraits of early pioneers of the Gas Industry.

A new series of calendar illustrations is being issued by the firm for the year 1933, which are attractive reproductions by colour photography of the original drawings used by Frederick Accum, the first chemist of the Gas Light and Coke Company, to illustrate his first two textbooks on Gas Manufacture. These books are of interest as being the first technical treatises in existence devoted entirely to the subject of Gas Lighting.

The first illustration comprises the plate facing the title page in Accum's "Practical Treatise on Gas Lighting," published in 1815, and is a photographic representation of a design by Clegg, made about the year 1810, for a complete plant erected for Ackerman, the publisher of Accum's books, whose premises were situated in the Strand. The whole of the establishment, his library, warehouse, printing office and workshops, together with his dwelling house from kitchen to drawing-room, was lighted with the gas supplied by this plant, to the exclusion of all other lights.

The calendar illustrations, a fresh one of which is issued each quarter, are accompanied by descriptive matter, printed under the date slip, and may be mounted in permanent frames after use as a calendar by those who may be interested to preserve them. Messrs. Holmes will be glad to replace the frames, previously issued, which may have become defective.

Lighting the Metropolitan Cattle Market, Islington.

The Corporation of London, in the City of London (Various Powers) Bill, 1932-33, are, among other matters, seeking powers to supply electricity to tenants of stalls in the Metropolitan Cattle Market and to prohibit the illumination of the stalls otherwise than by electricity.

The Corporation have no electricity supply in Islington, so that it may be presumed that they will obtain it from the Islington Borough Council. If the prohibition refers to the outside market stalls (known as the "Caledonian Market"), then it could be appreciated that the Corporation wished to do away with the use of the naphtha flare lamps on account of their danger. It is otherwise difficult to understand the prohibition of modern gas lighting to their ordinary tenants.

Dedication of the Consolidated Gas Company of New York's War Memorial.

The following note, relative to the official dedication of the War Memorial of the Consolidated Gas Company of New York, is taken from the December issue of "Gas Logic," the Company's House Organ:

As the great bronze bell of the Consolidated Gas Company chime boomed out 12 o'clock on Armistice Day, the stately tower which dominates the gas and electric building on Irving Place was dedicated to the soldier heroes of New York City's affiliated gas and electric companies who fought in the World War, and it was officially designated as the "Tower of Light." Leaders in industry, in finance, and in the arts gathered in the auditorium of the only memorial tower in our city to honour those 3052 officers and employees of the Consolidated and its affiliated organizations who served in the Allied ranks, and especially the seventy-four who gave their lives on the battlefield. The names of these honoured dead, written in enduring bronze and encompassed by the eagle, the torch, and the laurel wreath of victory, stood forth in a beautiful bronze plaque which is now in its place in the marble corridors of the Company's building and directly in the "Tower of Light" itself.

An audience representing every phase of our business life heard high tribute paid to the men who dropped their civilian occupations to answer the call of their country. Addresses were made by George B. Cortelyou, President of the Consolidated Gas Company, who presided; Floyd L. Carlisle, Chairman of the Company's Board of Trustees; and General James G. Harbord, U.S.A., retired. The bronze plaque was presented by William Cullen Morris, a Vice-President and Chief Engineer of the Consolidated Gas Company.

With this dedication the lofty tower of the Gas Company building, which furnishes the time of day to thousands of midtown residents and workers by day and offers a friendly guidance to the aviator by night, takes on a new significance. Five hundred feet above the sidewalk its bronze lantern, 37 ft. high, sends forth its steadfast rays—one to each point of the compass, a fifth pointing heavenward—to light the path of the nocturnal flier as he steers his course above our city. Below the beacon the tower is flanked by a series of graceful columns, outlined in the glow of many lamps at night, which furnish a noble monument comparable in beauty to that of the Unknown Soldier in Arlington Cemetery.

The great clock faces, which draw thousands of pairs of

Property of
Seattle Public Library

eyes to the Tower daily, and to their illuminated dials at night, measure 23 ft. 6 in. in diameter and can be seen for great distances in any direction. Their hands, which appear in greatly diminished size to the man in the street, are really 12 and 9 ft. in length and even the numerals are 3 ft. high. It requires a 150-lb. gun-metal hammer to strike the hours so that the clock can be heard many blocks away.

Gas Acts (1920 and 1929) Orders.

SPECIAL ORDERS.

Ilfracombe Gas Company.

A Special Order is being applied for by the Company to empower them, among other things, to reserve a proportion of any future issue of capital for exclusive offer to consumers of gas and to the employees of the Company, and to make provisions as to the conditions of issue; to enable them, with the consent of the Board of Trade, to offer capital for subscription by consumers of gas and by employees of the Company without first offering same for sale by public auction or tender; and to allow them to issue their authorized share capital remaining unissued by the creation and issue of preference stock or shares in lieu of consolidated ordinary stock, and to raise additional money by borrowing.

Northampton Gaslight Company.

The Company are making application for a Special Order to enable them to take over by agreement the undertaking of Long Buckby Gas Light, Coke, and Coal Company, Ltd., to extend the limits of supply, &c.

Corporation Undertakings' Results.

Ulverston.

At the monthly meeting of the Ulverston Urban District Council on Wednesday evening, Dec. 7, 1932, the Government Auditors' report upon the Gas Undertaking for the year ended March 31 last stated that the accounts showed a gross profit of £2828, which was insufficient by £171 to meet loan charges, income-tax, and the contribution of £600 to the relief of the general rate, and resulted in the reduction of the surplus on net revenue account from £5695 to £5524. The gross profit of the previous year amounted to £3516. The reserve fund stood at £3533, and the working balance at £1000 at the end of the year under audit. The Ulverston Council, in order to meet the appeal for cheap coke to the unemployed and poor persons of the town, decided to supply it to the local Unemployment Committee at a special price of 13s. 4d. per ton, the latter to distribute the coke to the unemployed persons and persons receiving public assistance relief at the price of 9d. per cwt., or 4½d. per half cwt. The Council agreed to loan a weighing machine and to find a yard from which the coke could be distributed. A new trouble has arisen, and it came to light at the monthly meeting on Wednesday night when a letter was read from the Ulverston Trades Council and Labour Party stating that they had received a complaint that the unemployed organization had added 1d. per cwt. to persons not members of that body, and that in the opinion of the Trades Council the matter required adjustment, owing to the fact that many trade union members, unfortunately unemployed, did not wish either to join the unemployed organization or pay this extortion. The Council discussed the matter, one member contending that it would have been better to have sold the coke from their own gasworks, and eventually referred it to the Gas Committee for consideration.

Everything for Hot Water

We have been able from time to time to illustrate and thus " pass on " many excellent examples of window displays covering almost every type of domestic gas appliance, each set up in some different way. Here are two more interesting displays arranged by Richmonds Gas Stove Company, Ltd., in their Queen Victoria Street Showrooms. These deal exclusively with water heating equipment of the very latest type—" Everything for Hot Water."

The year 1932 undoubtedly witnessed a considerable advance in the use of gas for water heating, and the future holds great promise for this side of the business. There is every evidence that the gas water heater is destined to become as popular as the gas cooker and the gas fire. The right equipment is now available, confidence is growing rapidly, and in many districts great progress has been made. Nevertheless, the general public may still be told with advantage what gas showrooms are offering in this field. Attractive window displays such as these do help tremendously.

One of our photographs shows three separate and distinct types of Richmonds water heating equipment, including the " Equator " thermal storage heater, renowned for its speedy and complete hot water service to all parts of the house—bath, wash basin, and scullery sink. On the right is a group of three " Don " geysers (each in a different finish) for the instantaneous supply of hot bath water. The central section of this window is devoted to Richmonds " Newlyn " and " Lynton " sink boilers, which are shown in white, cream, gun-metal, and chromium plated finishes.

The other display shown is devoted entirely to the " Equator," and the 12-18 and 25 gallon capacity sizes are demonstrated in alternative finishes. A clearly printed card describes the full purpose of these heaters, and the display includes a sectional drawing of a house, indicating how the " Equator " is connected to all the hot water taps upstairs and down. At the time these photographs were taken the whole of Richmonds showroom windows were devoted to hot water equipment, and the five separate displays also covered wash-boilers, canteen equipment, &c. Important inquiries resulted from the steady flow of gas consumers who, attracted by these displays, called for Richmonds booklets and general water heating literature.

BOOK REVIEWS

The "Turner" Retort*

(Low-Temperature Carbonization)

This publication gives details of further tests carried out by the Fuel Research Station staff on the Turner retort during November and December, 1930. An earlier test was carried out in March, 1929, and the results were published in 1930.

The retort is of the continuous vertical, internally heated type, the heating medium being low-pressure steam externally superheated to about 600° C. and injected into the base of the retort. A special feature claimed by the inventor for the process is an ingenious valve arrangement whereby the steam pressure in the retort is rapidly varied alternately between 4 lbs. per sq. in. and 0 to 1 lb. per sq. in., several times per minute.

The retort is constructed entirely of metal. Coal is fed through a double valve at the top, and coke extracted at the bottom by means of a vertical screw extractor gear into a cooling chamber, the throughput being about 8 tons per day.

In the earlier test it was not determined to what extent "breathing" system or "alternating pressure" device influenced the products of carbonization. This second series of tests was, therefore, carried out with and without this special feature, but the results obtained and the ease of manipulation in all three tests do not appear to show any appreciable variation.

As an economic proposition this retorting system is far from attractive by comparison with standard carbonizing practice.

A colossal amount of steam is used, about 135 lbs. for every 100 lbs. of coal, and this, on condensation, yields some 350 gallons of liquor which produces only about 6 lbs. of sulphate of ammonia per ton of coal charged to the retort. This tremendous yield of waste liquor would in itself make the system distinctly unattractive even if the yields of other products compensated for it.

The coke yield (a "satisfactory domestic fuel") is a little less than 13½ cwt. per ton of coal, but no reference is made to the proportion of this coke which is utilized in the production and superheating of the steam used for distillation of the coal.

Only about 2200 c.ft. of gas of 860 to 880 B.Th.U. per c.ft.—*i.e.*, 18 to 20 therms—is produced per ton of coal, and from this ½ to 1 gallon of light spirit may be scrubbed, with a reduction in C.V. of about 110 B.Th.U. per c.ft.

The tar produced (including "wax") is from 20 to 22½ gallons per ton of coal; it is a characteristic low temperature product, of low Sp.Gr. (0·98 to 1), and contains about 30% of phenols and only about ½% of "free carbon."

The report is another example of the meticulous care with which these investigations are carried out in full detail by the Fuel Research Board.

"TAMBT."

* Department of Scientific and Industrial Research. "Report of Further Tests by the Director of Fuel Research on the Turner Retort installed at the Works of the Comac Oil Company, Ltd., Coalburn, Lanarkshire." (Pp. VIII. + 35 and 5 Figures. Price, 9d. net. H.M. Stationery Office, London, 1932.

Gas Calorimetry*

Reviewed by James W. Wood, M.Sc. (Tech.), A.I.C., Research Chemist to the Joint Research Committee of the Institution of Gas Engineers and Leeds University

The broad principles of gas calorimetry are well understood in the Gas Industry, but it is not equally well realized that if the accuracy demanded by economic conditions and modern methods of gas manufacture is to be attained in gas testing, then it is not sufficient merely to purchase approved instruments; the most careful attention must be given to the conditions under which they are installed and operated.

For this reason the authoritative and exhaustive work of Major Hyde and Mr. Mills is heartily welcomed. The authors have had exceptional opportunities for studying the technique of gas calorimetry, and the results of that experience, supported by able theroretical treatment, are embodied in this book. It will therefore be of inestimable value to advanced students of gas technology, to all Gas Examiners, and to those officials of gas undertakings directly responsible for the actual testing of gas; to others the elaboration of detail may prove confusing rather than helpful.

The fundamental conditions governing gas calorimetry and the corrections to be applied to the various gas, water, and thermometric measurements, in order to secure the maximum accuracy in the determination of a calorific value, are treated with a completeness not hitherto attempted in a technical handbook. In particular may be mentioned the increase in the accuracy of gas measurement made possible by the newer designs of wet meters due to Boys and Hyde. The vagaries of mercury-in-glass thermometers receive ample treatment, the only noteworthy omission being the absence of any description of suitable apparatus and procedure for the step-by-step comparison of working and sub-standard calorimeter thermometers.

The testing of gas for official purposes with both recording and non-recording calorimeters naturally receives considerable prominence, and many points of procedure and manipulative detail are explained in a manner which would be impracticable in the usual "Notification" or "Prescription" of the Gas Referees. It is, however, not always plain whether some of the finer points are completely ignored in official testing, or whether they are sufficiently covered by empirical corrections if the prescribed conditions of testing are observed. Chapter VIII. is largely recapitulative, and summarizes the effects of the various errors and corrections in the form of their equivalent effect upon the B.Th.U. value attributed to a gas of typical character—500 B.Th.U. gas.

The authors have apparently been content to deal with finished gas, and the difficulties of the gas engineer in the examination of the fluctuating gas from different units of the carbonizing plant, although discussed in Chapter XVII., could with advantage have been treated at greater length.

The leading types of water-flow calorimeters are well described, with critical comments on their operation, and model log sheets for the recording of tests; while the Junkers type of instrument is fully treated there is a distinct preference for the Boys non-recording calorimeter.

Chapter IX. is an introductory chapter to the subject of recording gas calorimetry, and contains useful advice on the selection of a recorder most likely to suit local conditions. The main chapter of the book (Chapter X.) contains very clear and complete descriptions of the Fairweather, Boys, and Thomas recording calorimeters and their operation. In the case of the first two the behaviour of their component elements over a period of three months is indicated graphically for selected instruments, without, however, indicating the range of temperature, pressure, and specific gravity fluctuations to which the instruments have been subjected in that period. Briefer, but nevertheless adequate, accounts of other water-flow recorders and some inferential recorders conclude this chapter. In all cases the latest improvements in design are indicated.

Still water calorimeters for determining the calorific values of gases are regarded as of historic interest only, and are treated very briefly. A description of the bomb calorimeter and its method of use is included.

Explosion calorimeters of the Strache type receive a chapter to themselves. Their main advantage lies in their portability and the smallness of the gas samples required for a determination. For work on the plant and for use in out-of-the-way situations the portable calorimeter will always claim some measure of attention. Bearing in mind,

* "Gas Calorimetry," by Major C. G. Hyde and Mr. F. E. Mills, with an introduction by Prof. C. V. Boys. 376 + xvi. pp. 210 figs. Ernest Benn, Ltd., London, 1932; price, 42s.

however, the difficulties of obtaining precision with normal water-flow calorimeters, it is felt that the authors have been a little optimistic concerning the accuracy obtainable with explosion and other portable calorimeters.

The uncertainties in the calculation of a calorific value from the conventional analysis of a gas are discussed in Chapter XV., with illustrative figures from the published Reports of the Fuel Research Board and the Gas Investigation Committee, and it is made clear that while such calculations may have their value in special investigations, in general the calorific value of a gas can be more expeditiously and more accurately determined by the customary calorimetric methods.

The modern practice of gas drying leads to some slight complication in ascertaining the calorific value, and it is necessary to know the humidity of the gas. Suitable wet and dry bulb hygrometers are described for this determination, but it is to be noted that as gas, and not air, is in question, special formulæ and constants must be used instead of the usual Glaisher's factors. A convenient slide rule for facilitating the calculation has been devised by Mills.

Throughout the book the gross calorific value alone is considered. Four different definitions of the net value are given, their shortcomings are briefly discussed, and the matter is then dismissed. It is somewhat surprising, therefore, to find upon p. 26 the old fallacy that condensation commences in a calorimeter when the products of combustion fall to 100° C.

There are extensive quotations from official instructions regarding the use and operation of recording calorimeters and the methods of ascertaining average values from the charts. There is some convenience in having these instructions readily to hand, but as they are revised from time to time it will be necessary to exercise care in dealing with these sections of the book as time progresses.

The book is well produced, with adequate contents list and index. The numerous illustrations are clear, but a number of them would be improved by the addition of a scale or a few leading dimensions; in several cases the key or list of parts is placed at an inconvenient distance from the diagram to which it refers. Certain of the tables in the book will be in fairly constant demand by the gas chemist doing precise calorific value determinations; to some extent reference has been facilitated by the repetition of tables in a collection at the end of the book, but it is worth while considering whether for working purposes it would not be more convenient to issue the essential tables and nomograms as a separate publication. It is to be feared that the price, excellent though the book is, will place it beyond the reach of many to whom it would be of great service.

Summary of Statute and Case Law of 1932

As Affecting Gas Undertakings and Officials

Statutes.

Finance Act.—The taxation and other provisions of last year's Statute were fully examined in the "JOURNAL" for June 29 (p. 871), and the following are the main points to be observed.

The standard rate of tax is maintained at 5s. in the £, as are the reduced reliefs and allowances provided by the Emergency Budget of September, 1931 (*sec.* 15); the same rates of sur-tax are effected (*sec.* 16); annual pensions and allowances on retirement and payments to the relatives or dependents of a deceased official (whether voluntary—in the sense of the Stedeford v. Beloe decision—or contractural) are declared liable to income-tax (*sec.* 17), but are subject to the deduction of one-fifth as "earned income;" wear and tear allowances are increased by 10% as from the current fiscal year, 1932-33 (*sec.* 18); and the priority as between "losses" carried forward under *section* 33 of the Finance Act, 1926, and accumulated wear and tear allowances, as well as the time during which the former may be carried forward, is also provided for (*sec.* 19). The coming into operation of the Land Values Tax (enacted by the Finance Act, 1931) and the preparation of valuations thereunder, have been suspended (*sec.* 27) but not repealed. —(Royal Assent, June 16.)

Rating and Valuation Act.—The Rating and Valuation Act, 1928, applied to London the provisions of the 1925 Act regarding the Rating of Machinery, and, while public utility undertakings are outside the scope of these provisions, it is to be noted that the amendments to the Valuation (Metropolis) Act, 1869, and to the 1925 Act effected by section 2 (1) and (3) of the Act of 1928 are to be continued for a further period of five years and for the Second Valuation Lists respectively (*sec.* 1 (2)).—(Royal Assent, March 24.)

Coal Mines Act.—Part I. of the Coal Mines Act, 1930, provided for the administration of Coal Quota Schemes and was due to expire on Dec. 31, 1932; it is continued in force for a further five years until 1937 (*sec.* 1 (1)) and section I. of the Coal Mines Act, 1931, is continued operative pending the passage of an Act to enable effect to be given to the draft international convention of the International Labour Office of the League of Nations with regard to the limitation of hours of work underground in coal mines (*sec.* 1 (2)). —(Royal Assent, June 16.)

Rating and Valuation (No. 2) Act.—The Act of 1925 provides, by section 40 (1) thereof, that the Rating Authority "shall" serve on the occupier, owner, or lessee of every hereditament, a notice, whenever a new valuation list is to be prepared, for the purpose of obtaining such particulars as may be reasonably required for the valuation to be made under the Rating and Valuation Act, 1925. The new Statute has the effect of giving to Rating Authorities discretion in the issue of such notices in cases where the necessary information for the purposes of the Second Valuation Lists is already in their possession, by enacting that "may" is to be substituted for "shall" in the 1925 Act.—(Royal Assent, July 12.)

Gas Undertakings Act.

Gas Undertakings Act.—Municipal and Company-owned Gas Undertakings are now empowered (subject to the provisions of the memorandum and articles of a limited liability company) to invest in other companies carrying on similar processes, but the extent of such participation is specified in the proviso to *section* 1 of the Act. In the case of a local authority undertaking, any such investment is subject to the approval of the Board of Trade (*sec.* 1 (3)). The application of profits accruing from investments made in pursuance of this Act is provided for by *section* 3 thereof. —(Royal Assent, July 12.)

Kettering Gas Act.—The effect of this Private Act, which is only of a local character, but may be regarded as having an interest of national importance to the Gas Industry, is to prevent the particular Local Authority (in this case, the Kettering Urban District Council) from prohibiting the use of gas, for heating and lighting, in houses erected by the Urban Council.—(Royal Assent, July 12.)

Public Works Loans Act.—Local Authorities may make application to the Public Works Loan Commissioners for loans, to a maximum total of £18,000,000, from the National Debt Commissioners. Such loans may only be applied to the purpose for which the local authority is entitled to make application to the Commissioners.—(Royal Assent, July 12.)

Patents and Designs Act.—The law relating to patents and designs is amended in many respects by this Act, which took effect as from Nov. 1, 1932. In particular, as regards the extension of the period of provisional protection of a patent and of the acceptance of the complete specification. New grounds are provided upon which application may be made by petition to the Court for revocation or infringement of a patent.—(Royal Assent, July 12.)

Expiring Laws Continuance.—The following enactments, *inter alia*, are continued in force for a further period of twelve months:

Coal Mines (Minimum Wage) Act, 1912.
Unemployment (Relief Works) Act, 1920.
Dyestuffs (Import Regulation) Act, 1920.
Mining Industry Act, 1926 (*section* 18 only).
Public Works Facilities Act, 1930.
Increase of Rent and Mortgage Interest (Restriction) Act, 1920. (Royal Assent, Dec. 23.)

Case Law.

Income-Tax.—Where the General Commissioners had decided, as a *question of fact*—and had adequate grounds on which to arrive at their decision—that the surplus accruing

from the realization of certain securities held by a company was not income liable to tax (but a non-taxable capital accretion) the Scottish High Court ruled that they could not review the facts of the case, and the appeal from the decision of the Commissioners was dismissed.—(Commissioners of Inland Revenue v. Scottish Automobile and General Insurance Company, Ltd.—Court of Session, Nov. 19, 1931—reported 1932.)

A similar decision was reached in a case in the English Courts, when it was held that it is a *question of fact* whether "succession" to a business—for the purposes of the Income-Tax Acts—has taken place and that the ruling of the Commissioners on this point must be final (Fiat (England), Ltd., v. Williams, King's Bench Division, May 30, 1932).

It has also been decided that notwithstanding that a company had successfully applied to the Commissioners for treatment, for income-tax purposes, as a "ceased" business, and that there had been, in fact, a cessation of the normal course of business for three years by reason of the outbreak of a disastrous fire, the Commissioners' decision on this application relating to the old company was not binding on the Special Commissioners who heard the appeal of the new company, and that they were not estopped from finding that, as a fact, the newly constituted company *had* succeeded to the business of the old concern (despite the break in the continuity of trading during a period of three years, when only the technical staff was continuously employed). As there was evidence to support this finding of the Special Commissioners, Finlay, J., held that their decision to allow the claim for "succession" could not be disturbed by the Courts, and the appeal of the Crown was dismissed with costs (Wild, H.M. Inspector of Taxes, v. Madame Tussaud's (1926), Ltd.—King's Bench Division, June 6).

Arising out of these appeals to the Commissioners for Income-Tax on the question of "succession," it is important to note the ruling that the legal costs incurred are not allowable as a deduction—even where the appeal is in favour of the taxpayer—from the profits assessable under Schedule "D" (Allen, Inspector of Taxes, v. Farquharson Bros. & Co.—King's Bench Division, May 27).

As to the assessment of a discontinued business, the decision of the Court of Appeal in 1931—that section 34 (1) (*a*) of the Finance Act, 1926, applies only for the purpose of ascertaining the assessable profits for a year preceding the year of assessment and has no application, therefore, where it is necessary to ascertain the profits liable under section 31 (1) (*b*) thereof—has been affirmed in favour of the Crown. It follows from this judgment that in the event of a "succession" to an existing business, the discontinued concern must be assessed proportionately as provided for by section 35 of the 1926 Act (Wesley v. Manson, Inspector of Taxes; House of Lords, April 19).

Interest on Repaid Over-Assessment.

Where, as a result of a decision of the High Court, there is to be repaid to the successful appellant the over-assessed income-tax, the Court is empowered to award interest thereon. In a recent case (subsequent to the Chancellor of the Exchequer's War Loan Conversion Scheme) a similar rate of interest, 3½%, was sanctioned by Finlay, J. (Neumann v. Inland Revenue, King's Bench Division, Oct. 13).

It has been judicially decided that the cost of replacing a factory chimney, being a separate structure capable of separate use, is capital expenditure, being in the nature of the acquisition of a new asset. It was also ruled that as a complete reconstruction is not comparable with normal repairs, the "notional" cost (*i.e.*, probable extent of renovation which would have been necessary but for the re-building of the chimney) of the deferred repairs is not an allowable deduction from profits in the year of replacement. (Bullcroft Main Collieries, Ltd., v. O'Grady, Inspector of Taxes, King's Bench Division, March 15.) It is probable that this case will be quoted extensively as the authority for the proposed disallowance by local Inspectors of Taxes of all expenditure which may be incurred in this manner, and it is, for this reason, important to emphasize that the decision was given in respect of a chimney which was distinct from the main buildings of the undertaking; and also that as the renewal of buildings is in a different category from the renewal of plant and machinery, the judgment is only of limited application.

Where expenses (in this case, accountant's fees for an investigation of Excess Profits Duty liability extending over a period of years) are incurred at a later date referring to past assessments, it is not possible to re-open assessments already rendered final and conclusive under the taxing Statutes, in order to charge the cost of the new investigation to the particular years affected (Worsley Brewery Company, Ltd., v. Inland Revenue, King's Bench Division, March 18).

It is not possible to introduce in the High Courts a fresh point of argument which has not been raised in the lower tribunal, nor embodied in the "Case Stated" by the Commissioners. (Thomas Merthyr Colliery Company, Ltd., v. Davies, Inspector of Taxes, Court of Appeal, July 2[illegible]) This case also affirmed the decisions in both the Rhymney and Lochgelly cases with regard to the allowance of subscriptions to colliery trade associations.

Banks and Insurance companies transact business in the nature of investment, and have been considered to be liable in respect of capital profits realized on the disposal of securities, whereas ordinary trading concerns would be regarded, for income-tax purposes, as creating a non-taxable accretion of profit. In the case of the latter, it has long been the established rule that any loss on realization would not be allowed a deduction from trading profits. This distinction has been brought into prominence by the decision that the exercise by a Bank of the right of converting War Bonds into longer-term securities (of greater value than the Bonds) was, in substance, a realization at a profit which was assessable to income-tax. (Westminster Bank v. Osler, House of Lords, Nov. 15.)

The decision in the Hancock Case (1919) was distinguished by the learned Judge when it was held that the cost of an insurance policy, by which an insurance corporation undertook to grant annuities to the existing staff of the appellant company, on retirement, was not a deductible expense in the income-tax computation, although the pensions previously paid by the company had always been allowed. This ruling was based on the assumption that the payment of the lump sum in question did not rid the company of the liability to pay pensions to their retired employees but was, in effect, the acquisition of an asset. (Morgan Crucible Company, Ltd., v. Inland Revenue, King's Bench Division, March 11.)

Directors' Compensation.

It was held, reversing the 1931 judgment of the Court of Appeal, that in particular circumstances the payment by a company to a retired director of a lump sum compensation was not remuneration but was a capital receipt not subject to tax in the hands of the recipient. (Dewhurst v. Hunter, House of Lords, April 14.)

On the other hand, the decision of the Court of Appeal—that a voluntary pension made after the respondent had ceased to hold office was not taxable under either Schedule "D" or Schedule "E," as it was "a mere casual payment dependent on goodwill" of his employers—was affirmed in Stedeford v. Beloe (House of Lords, March 11); but the ruling of the successive Courts was rendered inoperative for subsequent years of assessment, by virtue of section 17 of the Finance Act, 1932 (*see under* "Statutes"). This section does not, however, over-rule payments within the scope of the "Dewhurst" case (*supra*).

Stamp Duties.—The issue of letters of allotment, in connection with a scheme for the reconstruction of a company and the formation of a new company to acquire the undertaking of the existing company, has been held not to constitute an "issue" of shares to the original allottees such as to claim exemption from the *ad valorem* stamp duty, under the provisions of the Stamp Act, 1891, as amended by *section* 55 of the Finance Act, 1927. (Oswald Tillotson, Ltd., v. Inland Revenue, Court of Appeal, July 21.)

Companies.—Provided nothing to the contrary is prescribed by the Memorandum or Articles of Association of the company, the surplus assets (in a voluntary winding-up under the Companies Act, 1929) are distributable rateably between the holders of both the preference and the ordinary shares of the company. (*In re* William Metcalf & Sons, Ltd., Court of Appeal, Nov. 4.)

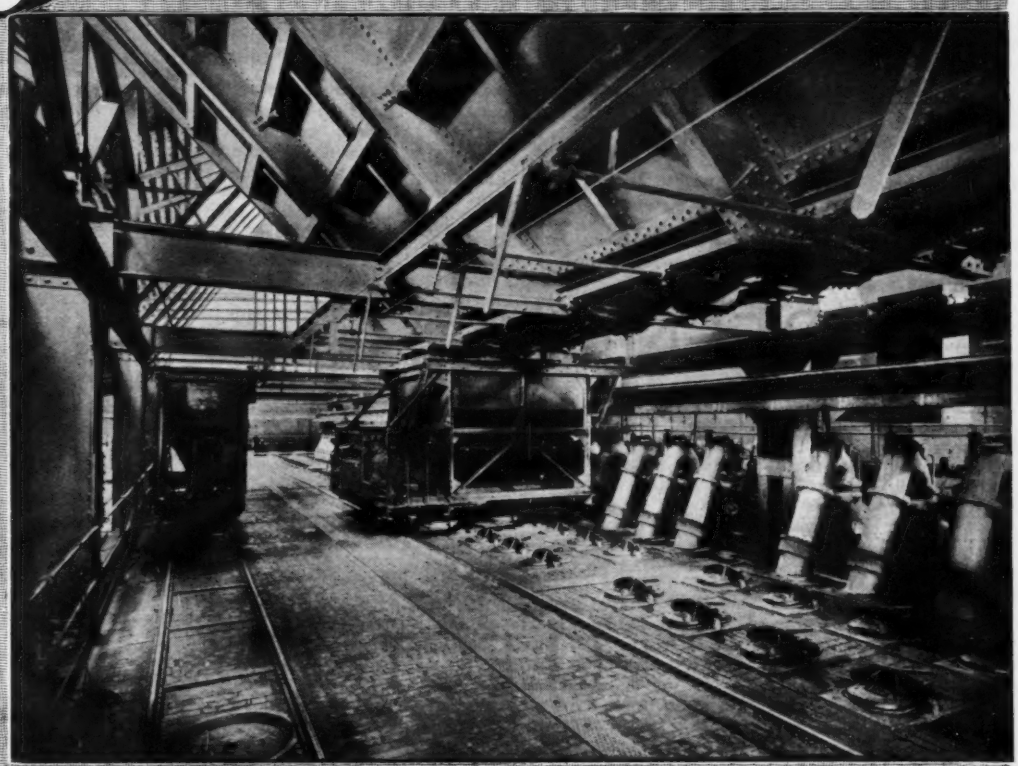
This decision as to the distribution of the surplus assets of a limited liability company in voluntary liquidation (the surplus assets remaining after the discharge of all debts and liabilities *and* the repayment of the total paid-up capital) reverses the ruling of Astbury, J., in Colleroy Company, Ltd., v. Gifford, 1928, Chancery Division, but follows the judgment of Eve, J., in the recent case of *In re* John Dry Steam Tugs, Ltd., Chancery Division, February, 1932.

Municipalities.—The Court of Appeal affirmed the decision of Eve, J., that a municipal corporation was entitled to expend part of the general rate fund of the borough on the establishment of a printing and book-binding works for the performance of the statutory duties of the corporation. (Attorney-General v. Smethwick Corporation, Court of Appeal, Feb. 4.)

Employees.—Section 16 of the Electricity (Supply) Act, 1919—as amended by section 1 of the 1928 Act—provides that any officer or servant regularly employed by an undertaking who proves that, in consequence of a scheme (effected *within five years* from the date thereof) for the improvement of the electricity supply in any district coming into operation, he has suffered loss of employment or

W-D

INTERMITTENT VERTICAL CHAMBERS



VIEW OF CHAMBER AND PRODUCER TOPS ON ONE OF THE INSTALLATIONS ERECTED FOR THE CROYDON GAS COMPANY

13 INSTALLATIONS
IN OPERATION OR UNDER CONSTRUCTION
IN GREAT BRITAIN

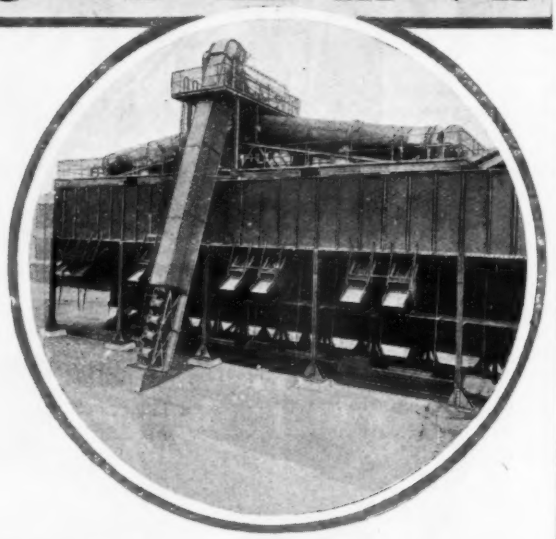
	TONS OF COAL PER DAY
RAMSGATE (1ST INSTALLATION)	68
RAMSGATE (2ND INSTALLATION)	40
GLASGOW (DAWSHOLM)	230
TAUNTON	24
CROYDON (1ST INSTALLATION)	230
CROYDON (2ND INSTALLATION)	230
GAS LIGHT & COKE COMPANY :-	
SOUTHALL (1ST INSTN)	300
SOUTHALL (2ND INSTN)	300
SOUTHAMPTON	180
HUNTINGDON	10
FUEL RESEARCH STATION (EAST GREEWICH)	9
PORTSMOUTH (HILSEA)	253
TOTTENHAM	373

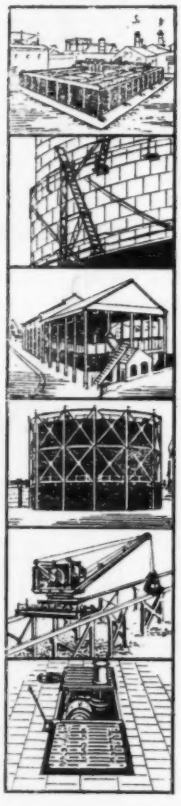
TOTAL CAPACITY **2247** TONS OF COAL PER DAY

THE WOODALL-DUCKHAM VERTICAL RETORT & OVEN CONSTRUCTION COMPANY (1920) LTD
ALLINGTON HOUSE, 136-150, VICTORIA ST
LONDON S.W.1.

HANDLING PLANT

COKE
SCREENING
&
ELECTRIC
TELPHERAGE

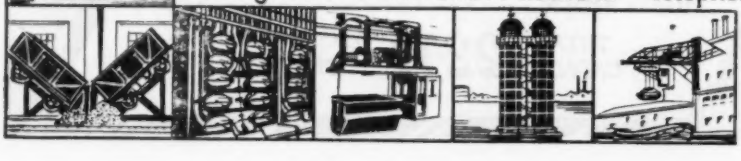




ROBERT
DEMPSTER
& Sons Ltd.

ELLAND YORKS.

Telegrams "DEMPSTER ELLAND" Telephone No. 261 Elland P.B.Ex.



diminution of pay shall be entitled to such compensation as the referee or Board of Referees may award, provided that—

(*a*) the undertakers affected by the scheme do not show that equivalent employment was available to the employee, and that

(*b*) the loss of employment or diminution of pay arose otherwise than as a result of misconduct, incapacity, or superannuation.

In circumstances where certain workmen employed by the corporation lost their employment in two power stations owned by the municipality, by reason of the closing-down in September, 1930, of those particular stations (with a view to the concentration of supply from a new power station established under an electricity scheme which came into operation in 1924), Sir Harold Morris, K.C., as Referee, found, as a fact, that the employment had been lost in consequence of the scheme, but allowed the contention of the corporation that as the workmen's dismissal took place more than five years after the scheme became operative, no compensation was recoverable under the provisions of the 1919 Act. A special case was stated for the opinion of the High Court, when the award of the Referee was upheld. (Betts and Others v. Leicester Corporation, King's Bench Division, Feb. 1.)

RECOVERY OF WAGES DURING INCAPACITY.

An unsuccessful appeal was made to the Court of Appeal against the ruling of the King's Bench Divisional Court that an employee was entitled to recover wages for a period during which he was absent from work (by reason of an accident to his thumb) under the terms of an agreement which provided for such payments to be made during periods of " sickness; " this was held to include incapacity as a result of an accident and not merely as arising from ill-health. (Maloney v. St. Helen's Industrial Co-operative Society, Court of Appeal, Nov. 3.)

Insurance.—Where a policy provided that it was a condition precedent to the respondent insurance company's liability that the statements in the proposal form were correct, and the insured had stated in the proposal form that the motor-lorry, which was the subject of the claim, would be used for the purpose of delivering coal; the High Court upheld the Arbitrator's award (on a finding of fact) that, although the accident occurred while the lorry was being used for the haulage of timber, a claim under the policy was competent. (Morgan and Another v. Provincial Insurance Company, Ltd., Court of Appeal, January.)

Workmen's Compensation.—In order to claim compensation under the Act it is necessary to prove that the accident in question arose *out of and in the course* of the employee's employment, and where the deceased had no right or duty to cross the bottom of a pit and thereby incurred serious peril which resulted in his death, the House of Lords reversed the ruling of the County Court Judge, and held that, although hazardous, it was due to the workman's desire to expedite the process he was engaged to control. The case was therefore within the scope of the Act and compensation was ordered to be paid to the deceased's widow. (Thomas v. Ocean Coal Company, House of Lords, Nov. 15.)

Rating.—In the case of Metropolitan Water Board v. St. Marylebone Assessment Committee (1923; 1 K.B. 86) it was decided that a statutory obligation to set aside a Sinking Fund properly fell on the landlord and not on the hypothetical tenant. This decision was quoted by Counsel for the Appellant Assessment Committee in the Court of Appeal, but the case was differentiated (as were the other cases of Port of London Authority v. Orsett, 1920, and Kingston Union Assessment Committee v. Metropolitan Water Board, 1926) on the grounds that as a compulsory contribution to sinking funds prescribed by the London Electricity (No. 2) Act, 1925, did not create an asset for the benefit of the undertaking, the St. James' and Pall Mall Electric Light Company, Ltd., was entitled to a reduction from the gross receipts in respect of this statutory appropriation of profits. This ruling has now been set aside, and it has been established that even though the annual sums so set aside are for the ultimate benefit of the London and Home Counties Joint Electricity Authority (enabling the transfer of the undertaking from the company in 1971, free of charge) there was no sufficient reason to distinguish these appropriations from the operation of the existing law. The appeal of the Assessment Committee was accordingly allowed. (Westminster Assessment Committee v. St. James' and Pall Mall Electric Light Company, Ltd., Court of Appeal, Dec. 19.)

It is of interest to note the ruling of the Carmarthen County Court that a proper construction of *sections* 31 (1) and 37 (8) of the Rating and Valuation Act, 1925, requires appearance in person before the Assessment Committee as a condition precedent to the right of appeal to Quarter Session, and that a letter written by the ratepayer to the respondent Assessment Committee did not constitute an appearance in accordance with the Act. The appeal was accordingly dismissed without the subject matter of the application being argued. (Fox v. Llandilofawr Assessment Committee, Nov. 25.)

An Australian Display of Gas Appliances

The accompanying photograph shows the stand of the Parkinson Stove Company (Australia), Ltd., at the Oakleigh Cookery Demonstrations of the Colonial Gas Association, Ltd., last November. Large and enthusiastic audiences attended each session, and the lecturess was Miss Gwen Hughes. This effort is an indication of what is being done in Australia to push the sale of gas appliances manufactured by a Subsidiary of a well-known British firm.

CONTINENTAL NOTES

SLIDE RULES FOR GAS-MAIN CALCULATIONS.

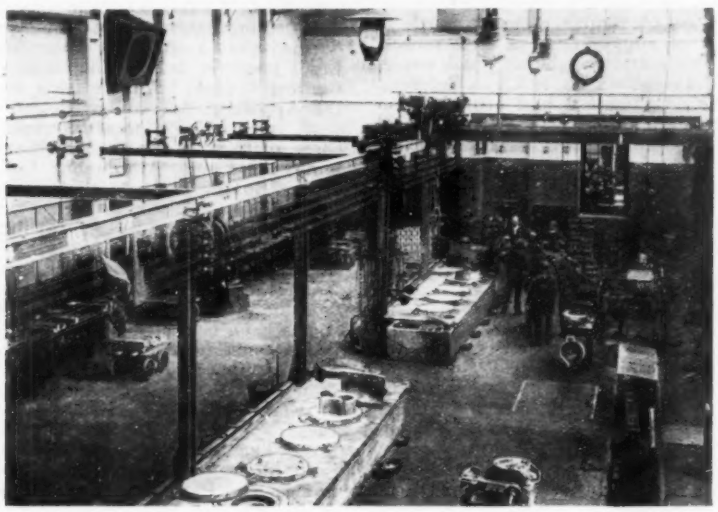
F. Walter, in " Journal des Usines à Gaz," 1932, 56, 592-594 (Dec. 5), describes, with details of the method of construction, three slide rules of use in calculating dimensions of gas mains and the concomitant pressure losses for coal gas having a normal specific gravity. The individual slide rules are based respectively on three formulæ commonly employed in France—namely, Monnier's formula, Aubéry's formula, and the Chicago formula, the latter being applicable to the high pressures prevailing in feeder mains and covering distribution pressures up to 10 atmospheres with a delivery pressure of 8 in. W.G. It may be recalled that doubt has been cast on the accuracy of Monnier's formula (see " JOURNAL," Vol. 194, p. 832).

It is stated that the Société des Haut-Fourneaux et Fonderies de Pont-à-Mousson will supply these slide-rules gratuitously on request.

THE ROYAL MINT*

Extensive Application of Gas

The Royal Mint, in which the coinage of the United Kingdom is struck, was erected in 1810, and being situated just within the boundary of the Commercial Gas Company's area of supply, is one of their largest and most important consumers. The average consumption of gas at the Mint for the last nine years has been approximately 72 million c.ft. per annum. This figure is greater than that of the total yearly output of a number of gas companies in this country.



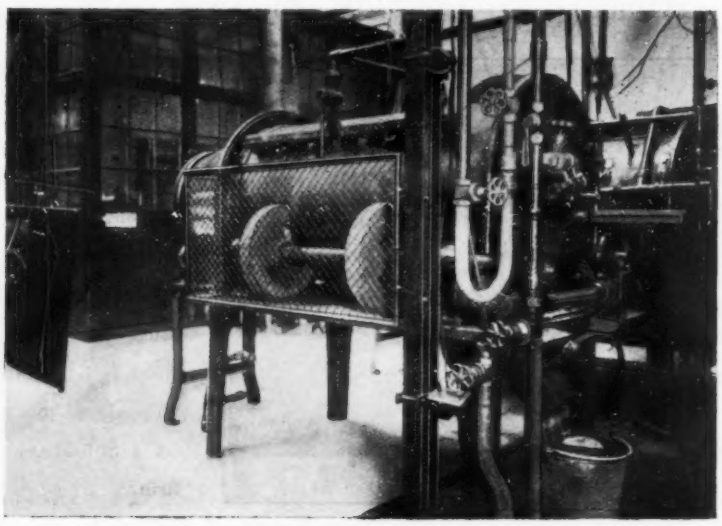
MELTING SILVER IN GAS-FIRED FURNACES.

Manufacture of Coins.

The actual work takes place in a series of departments which are referred to as rooms, the metal being passed from one room to another until it reaches the final stage. For the purposes of this article we shall follow the various stages in the manufacture of silver coins.

Within the Mint are the massive vaults and strongholds which contain the supplies of bronze, copper, nickel, and silver, and it is from here that the metal is taken to the silver melting-house where the process of coining begins. In this room, full of heat and noise, we are at once reminded of the important part that the Gas Industry takes in this work, for in front of us we see a number of gas furnaces which are heating the crucibles containing the required weight of pure metal. Necessary alloys are added, and the heating continues until the seething metal attains a temperature approaching 1200° C. From the slightly raised lids of the crucibles one may see different coloured flames shooting constantly from beneath, while showers of sparks fall around. When fully working, this room presents a vivid picture.

The metal having reached the required temperature, the white hot crucibles are lifted in turn from the furnaces by means of conveyor lifts and transported to where a series of narrow vertical moulds is waiting. Each crucible is then tilted and a narrow silver jet pours into the moulds. At this stage a sample is tested in the laboratory. The molten metal within the moulds is soon cooled, and having now taken the form of solid bars of silver, it is next stamped with an identification mark, after which it is filed to enable it to be more easily handled. As soon as the sample of metal has been approved by the Chief Assayer, the silver bars are wheeled to an adjoining room where rolling machines flatten them to the approximate thickness of the required coin. This rolling has the effect of making the strips of silver exceedingly hard and unmanageable;



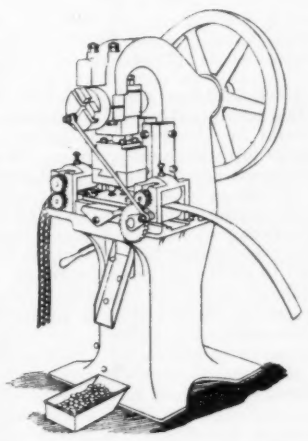
GAS-FIRED ROTARY FURNACE FOR ANNEALING COIN DISCS.

(This furnace softens the blanks ready for them to be stamped.)

* From the "Co-Partnership Herald" of the Commercial Gas Company.

they are therefore made red hot in a special gas furnace, from which they emerge malleable enough for the final rolling process. To test the correct thickness of this rolling a single trial blank is punched from the strip and weighed, as the limits allowed by law are too small to be accurately measured.

The metal is now ready for the coins to be made from it. For this purpose the strips are passed into machines that punch scores of blanks from them. These blank circular discs are the size of the intended coin, and from the first batch a sample is weighed by a tester upon a fine balance. The blanks are then annealed in a gas-fired rotary annealing furnace. As this process causes them to become discoloured, they are next washed in an acid bath and dried in a rotating tub through which a strong current of hot air passes. After this treatment they are once again bright and shining and ready for the stamping machines.



Machine for Cutting Out Coin Discs.

The Mint has forty-five coining presses, capable of making from 4500 to 5000 coins per minute. At each press a man feeds the machine with long silvery piles of blanks. With lightning speed each coin is grasped by a pair of steel fingers and slid between two steel dies, one bearing the design for the obverse of the coin and the other for the reverse. These twin dies close upon the blanks with a pressure of over fifty tons, leaving an impression that takes fifty years to wear out. A steel collar which holds the blank adds the serration to the edge of the coin.

The bright new coins have now to undergo a number of strict tests. First they are weighed separately upon automatic balances. They pass steadily through the balance which sorts them automatically into three compartments: standard, light weight, and overweight. They are next handed over to a ringer, who places them in a machine which projects them rapidly upon a steel anvil. The operator meanwhile listens intently for any flaw in the ringing tone emitted. Now ready for their final examination the coins are taken to the overlooking machine and spread evenly upon a wide moving canvas belt which reveals both sides of the coins to the examiners, who reject those which have been dented, chipped, or in any way defaced.

All that remains now is for them to be passed to the counting room, where machines count them and seal them in bags of definite amounts. These bags of coins are then taken to the same vaults and strongholds from which they came as raw material. Eventually the coins are transferred to the chief banks and their branches.

From the moment the metal enters the melting-house and proceeds through all the stages of manufacture, it is repeatedly weighed before and after every process, and each department is responsible for handing on the same weight as it has received.

A. C. G.

REGISTER OF PATENTS

Gas Flow Through Purifiers.—No. 382,578.

R. & J. Dempster, Ltd., and Sheeran, A. J., both of Manchester.

No. 15,902; June 6, 1932.

This invention relates to valves for gas purifiers provided adjacent to the inlets and outlets of each box.

The object is to provide with a valve for by-passing the gas, a single-disc valve with gas outflow passages adapted for allowing the reversal of flow of gas through a box.

A valve of a single-disc type may be operated through a vertical spindle. For the casing for the valve there is a single aperture for allowing gas to pass either above or below the disc valve, according to the position of the latter. Such a valve may be provided at each inlet and each outlet of each box of the purifier system concerned.

The valve is so designed and situated that at one position, relatively to a by-pass valve, the gas is able to flow through all the compartments or tiers of iron oxide, but at another position of the by-pass valve the gas is by-passed or prevented from flowing through purifying material at a lower tier or tiers thereof.

Electrical Precipitation of Tar.—No. 380,890.

Whessoe Foundry and Engineering Company, Ltd., of 25, Victoria Street, S.W. 1, and Grant, A. G., of Darlington.

No. 21,075; July 23, 1931.

The object of this invention is to provide apparatus having a high efficiency without loss of space, and which is simple and cheap to construct. The nest is constructed of plates pressed or rolled to form corrugations of half hexagon section. The plates are secured in parallel relation to form a honeycomb nest of hexagonal passages in the centre of each of which a single discharge electrode is arranged. The nest, state the patentees, contains no useless free space and is very nearly as efficient electrically as the pipe treater, while at the same time it is extremely simple and inexpensive in construction.

In a modified form of construction the plates are given a semi-circular corrugation and two discharge electrodes are arranged in each passage.

No. 381,631.

No. 21,076; July 23, 1931.

The treating nest is surrounded by an annular jacket through which the gases pass before entering the treating passages. The treater is thus shielded from the effects of atmospheric conditions, changes in the temperature of the gases taking place before they enter the treating passages, and the flow is uniform throughout the treater.

The gases suitably enter the insulating jacket at its upper end and pass downwardly through a perforated diaphragm to the lower end of the treater shell. The gases then pass upwardly through a second perforated diaphragm into the treater passages from the upper ends of which they are discharged. The perforated diaphragms ensure even distribution of the gases at the entrances to the annular jacketing space and to the treater passages, respectively.

It is claimed that the invention is particularly suitable for use where large changes in external temperatures are anticipated or where the gas temperature differs appreciably from the atmospheric temperature.

Deflecting Plates for Ovens.—No. 382,115.

Russell, E., of Derby.

No. 34,109; Dec. 9, 1931.

This invention relates to the mounting of deflecting plates for directing the flames of burners outwardly away from the oven side or back to the centre thereof, and protecting the holes in the burner from foreign matter. The object is to provide a method of mounting which will be simple and efficient and will enable the deflecting plates to be readily removed and replaced when desired.

Two slots are formed in the side or back wall of the oven. A deflecting plate is employed having projections thereon in positions corresponding to the slots in the oven wall and of such a form as to engage in the slots and support the plate in the desired position. The projections may conveniently be in the form of square hooks, the face of the hook bearing against the oven wall being inclined or tapered in such a way that as the deflecting plate by its weight falls into the correct position the projections tighten in the slots and make good joints.

A "Gauge" Burner for Fires.—No. 382,660.

Radiation, Ltd., of Birmingham, and Yates, H. J., of 15, Grosvenor Place, S.W. 1.

No. 21,758; July 30, 1931.

The object of this invention is to simplify the regulation of the burners of luminous flame fires. It comprises the combination with the main burner, of an extra burner, which is placed in a suitable and easily accessible position between the regulator and the main burner nipples, the extra burner serving as a gauge by which the required regulation can be effected. Also the invention comprises the combination of a removable cover cap or a tap with the extra burner.

WELFARE PLANNING FOR . . . PROGRESS . . .

By J. Leeming Robson, of the Birkenhead Gas Department

That the South Metropolitan Gas Company has availed itself of the services of the National Institute of Industrial Psychology proves that it recognizes the tremendous importance of welfare work, and the planning on scientific lines of general working conditions.

Post-war development in all branches of industry has been so rapid that in some cases the period of depression through which we are passing has brought about complete chaos. Not only is this true, but what may have been marginal units in brighter days have been crushed out of existence through no other cause than the inefficiency of their organization.

The Gas Industry, being of a monopoly nature, is in rather a fortunate position, and able to brave the elements of the depression. Though this be true, every unit of the Industry has a responsibility to itself and the State. No monopoly industry which continues to be subsidized by the community, be it municipal or private, has a right to exist.

Industrial recovery depends on the complete re-organization of every unit so that it may be ready to meet effective demand, and supply its consumers readily, efficiently, and cheaply. Only in this way can confidence in our economic structure be revived. If the consumer can be supplied cheaply and expeditiously, then all doubt and mistrust in economic systems will be removed.

Science has aided industry in almost all spheres; improved machines, methods of production and distribution, and the application of art to the various appliances used by the consumer, have enabled the Gas Industry to develop on an unprecedented scale. Its lethargic pre-war state has given place to a most progressive organization, competent and ready to meet the competition of its infant opponent—electricity.

The development, thus far, is almost wholly concerned with the sales branch. The efficient organization of all branches is the most pressing, and sectional development is not likely to prove successful—in fact, success will be retarded by the inefficiency and lack of co-operation existing in the other sections.

Encouraging Co-Operation.

The primary purpose of any policy should be to achieve the full co-operation of every worker within the Industry, and in every way to consider comfort and welfare. Financial benefits are sometimes thought to provide the most potent influence in developing contentment, and that given good wages the worker will respond adequately to every demand. This may have been true at one time, but it should be remembered that the standard of intelligence displayed by the workers is much higher than in pre-war days. More than that, industrial methods demand this higher standard, and it is only right that the workers should receive every consideration.

Fair wages rates in the Gas Industry have removed discontent, and are undoubtedly responsible for the removal of causes of labour disputes and losses caused by disorganization. National considerations have made this possible and proved that National agreements can be formulated on a satisfactory basis. Further improvement may come when all staffs—administrative, technical, and clerical—are covered by similar agreements.

Conditions of employment are not satisfied by good wages and holidays alone. There are other essentials—atmosphere, clean and well decorated workshops, lighting conditions, heating regulation, convenience of machinery, periods of rest, and attention to medical needs, in general all those considerations which make for the happiness and comfort of the workers. Every administrator must pay attention to these elements, otherwise the full benefits of scientific improvement will never be achieved.

Working Requirements of Employees.

Gas making and supply form the two main branches of the Industry, and for the purpose we may discuss, briefly and superficially, methods which may be introduced in the planning and lay-out of buildings and offices, and attention which may be given to the working requirements of employees.

Workshops, buildings, and offices should be airy, well lighted and heated, and possessing every convenience which will reduce monotony. In the early planning stages the whole process of the factory or workshop should be visualized, the action required in the work studied, and every possible contingency provided for.

Each building and workshop should be considered in its relationship with other branches, the degree of convenience should be the principal factor, and in no case should a workshop which undertakes work connected with every department occupy an isolated position.

As far as is possible, what may be described as the continuous line should be the guiding principle. Avoidance of all arrangements which cause unnecessary physical exertion and consequent loss of time is essential. Hand machinery should be fixed conveniently so that the user may operate without conscious exertion. Adequate supplies of working materials should always be on hand, sundry tools should be examined regularly, and all causes of delay, such as journeys to stores for working materials, avoided.

Mechanical supervisors, foremen, and works superintendents should have their duties so organized that there is complete co-operation and every facility for continuity of work is developed. Reports and requisitions are a necessary feature in this connection, though it may be said that no successful organization is possible or complete without an efficient costing system.

Value of Costing Systems.

The value of costing systems is now being recognized, and their development is responsible for more efficient financial control. Piecemeal efforts in this direction are useless, and while it is not possible to lay down hard and fast rules for costing, the development of a system which suits the industry and provides the desired results is not difficult to devise. It is perhaps true to say that a costing system will do as much to increase the efficiency of the employee as it will to increase the efficiency of the organization.

Personal study and examination of the existing conditions is necessary before definite improvements can be suggested. A general statement, however, may be permitted. The time element is of major importance in production and distribution costs, and particular attention should be paid towards methods whereby losses may be eliminated.

Retort, power, purifying, and boiler houses should be well equipped, and there should be a stock of working materials on hand, at least enough to last one week. The journey to the stores may provide workers with a break, but it may, and often does, provide a most expensive break, especially if there are two or more seeking attention at the stores. "Current Affairs" and the like, while of interest to the individual, are of costly consequence to the undertaking.

Stores organization and equipment demands separate and very careful attention. A single floor building should be the aim, and which provides adequate accommodation, allows of supervision, and, most important of all, affords the maximum convenience for issuing and receiving of stocks and stores.

Extension of Machinery.

The use of machinery should be extended at every available opportunity, at any rate it should always be under consideration. Opposition to machinery is sometimes the determining factor against its use, mainly from a fear of labour troubles. The greater use of machinery will in time lead to an absorption of displaced workers, if not within their own, then in allied industries. Production will ultimately be increased, costs will fall, and demand will be stimulated; inevitably, therefore, the interests of the workers rest in the better and more general use of machinery.

Another advantage of machinery lies in its health benefits. Machine-using factories have a higher health standard generally than in those employing hand labour. The impression that machines may be adopted for certain classes of work is often an inducement to greater effort by the worker, and consequently the benefits of this greater effort may provide favourable comparison and preference for the hand work.

The promotion of good health conditions and sanitary arrangements cannot be over-emphasized. The appalling national cost of sickness and ill-health can be reduced by a determined effort on the part of industry. There are some undertakings which have sick-pay schemes in operation, and having made this provision think they have, at any rate, satisfied a moral responsibility. But is this enough?

Surely precaution should be the guiding factor! Effort should be made towards reducing this cost to an absolute minimum.

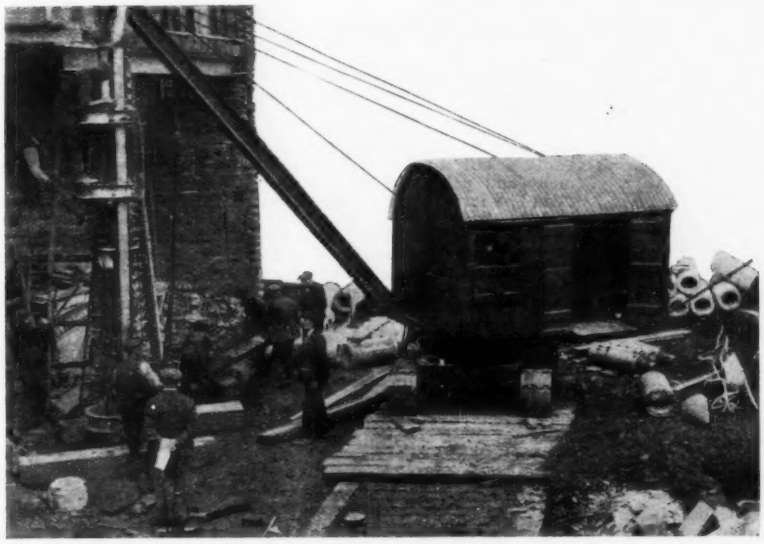
The provision of first-aid treatment can be made by providing facilities for the workers to qualify in this treatment. It is important to remember that after a successful course has been completed, and a certain number of employees have qualified, that the work is not finished. Interest and development must be maintained, else the whole value of the experience will be lost in a few weeks.

When the undertaking is large enough local conditions may allow of part-time, or occasional, attendance of a medical practitioner and qualified nurse.

Attention to sundry and minor ailments might be the means of providing treatment in time and avoiding necessity of loss of time and expense to both the individual and the community. Such arrangements may be the means of reducing the national cost of sickness, and at the same time increasing the economic efficiency of the country. Attention of this kind might cause detection of physical incapacity for allotted tasks, and the guidance of the medical mind might assist in the better selection of workers.

Adequate rest periods require careful attention, and it can only be suggested that expert advice should be obtained before any system is adopted.

Scientific improvement is concerned with every section of the Industry, and not, as is supposed, in the production of appliances and other incidental features. To ignore, therefore, the application of scientific methods to labour and other organizations is like ignoring medical advice when an operation seems necessary, and the patient having agreed goes as far as the operating table, and then pleads with the surgeon to perform half the operation and trust to luck for a safe recovery.



THE WEST-ROTINOFF SHELL PILE*

Mr. Rotinoff was once asked, " What is the least number of piles for a contract you will undertake to drive? " His reply was: " I don't think you can expect us to drive less than one."

Of course, when this question was asked, the matter of driving a few piles was almost out of the question as the transportation, erection, and dismantling of plant constituted an expensive matter and involved a considerable period of time.

Messrs. West's Rotinoff Piling and Construction Company, Ltd., have recently evolved a new piling plant for driving their special patented system of concrete shell pile for the express purpose of dealing with contracts involving a small number of piles, or driving piles under difficult conditions, where there are no roads whatsoever for the transport of pile frame, boiler, &c.

The small outfit shown in the illustration can be adapted to an ordinary Ruston-Bucyrus petrol-driven navvy with caterpillar track, without any alterations, and although it occupies only a headroom of about 20 ft., it can drive piles of any length.

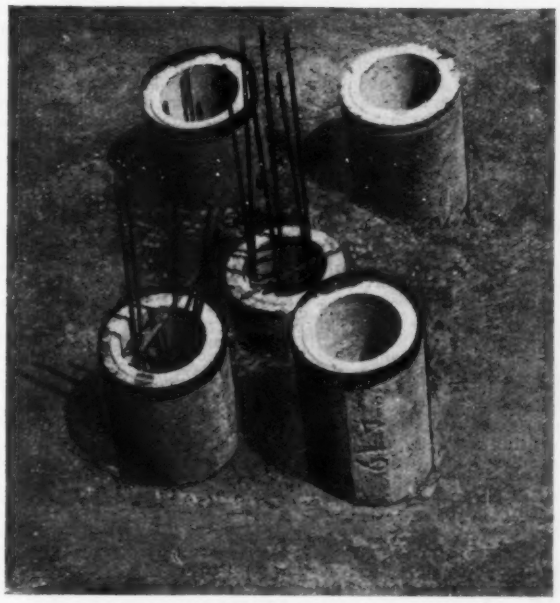
This machine can be transported to the site where the piles are required to be driven, and under its own power can run off the lorry and commence pile-driving within an hour or two of its arrival, so a small contract of a few piles can be commenced and completed within a few days, as the erection and dismantling problem is almost entirely eliminated.

Precast Shells.

The West's Rotinoff system consists of driving into the ground precast pipes, or shells, of diameters varying from 15½ in. to 24½ in., preceded by a concrete point, and after the pile has been inspected from top to bottom from the inside, the hollow pile is filled with concrete, reinforced as desired.

The concrete shells are usually in 3 ft. lengths, so that there is no waste in any pile, as only the exact number of shells are driven into the ground that are required in the pile. This obviates the heavy expenses incurred in lengthening a pile which is too short, or wastage through a precast pile being made too long.

For contracts involving a larger number of piles, large piling plants are employed which have been specially designed, by which great speeds are obtained. Two of these plants were constructed in the Works of West's Gas Improvement Company.



West-Rotinoff Shell Piles, with Reinforcement in Position.

The record at the moment in number of piles is 41 in one day, and for lineal footage 800 ft. in one day, both of which were carried out with one plant.

It often occurs that Scotch Derrick or Guy Derrick cranes are preferable to pile frames for driving the piles, and by using hanging leaders the West's Rotinoff pile can be easily driven from them.

* From " West's Gas."

Gas Undertakings (Basic Charges)

Proceedings of a Joint Parliamentary Committee

(*Before Lord* MESTON (*Chairman*); *Viscount* HEREFORD; *Lord* CHESHAM; *Lord* HUTCHISON OF MONTROSE; *Lord* RHAYADER; *Mr.* OSWALD LEWIS; *Dr.* HOWITT; *Mr.* ERNEST YOUNG; *Mr.* T. WILLIAMS; *and Capt.* PEAKLE.)

(*Concluded from p.* 855.)

Thursday, Dec. 15.

Mr. *A. W. White*, of Messrs. Cash, Stone, & Co., Chartered Accountants, was then called to give evidence on behalf of the National Gas Council. After indicating the close connection between his firm and matters concerning policy, &c., as affecting gas companies, Mr. White said that at the present time 51·7% of the gas supplied in this country by gas companies was sold on the basic price system. Discussing the incidence of various items in the cost of manufacturing and selling gas, Mr. White said the main items came under the headings of manufacture, on the one hand, and distribution and sale on the other. The former, of course, would be a uniform figure no matter where the gas was sold so long as it was manufactured at the same works, but according to the distance of supply from the works so the cost of distribution and sale would necessarily vary. In what was normally called an inner area, the only practical method of charging for gas was on an average price, but differentials or different basic prices must be enforced in outer areas, and Parliament and the Board of Trade from time to time had sanctioned temporary and permanent differentials.

Dealing with the suggestion that the extra cost of supplying an outside area varied in inverse ratio with the consumption, Mr. White said this definitely was not so. In the first place, a main had to be laid which was larger than was necessary for the immediate requirements, and as that main was gradually fully loaded so, looking ahead, further mains had to be laid. Moreover, as the distance from the gas-works increased it became necessary to resort to boosting to a greater and greater extent. The cost of pumping could not vary in inverse ratio to the increase of consumption. Again, the cost of distribution was greater as compared with an inner area owing to the smaller number of consumers per mile of main, and experience had shown that the cost of supplying an increased number of consumers did not diminish at the same rate as the consumption increased. There would, however, be a reduction in some of the items of cost. On the other hand, there was an increase in other items. For instance, gas companies now had to work very hard to get new consumers and increase the consumption on the part of existing consumers. It was necessary, for instance, to keep in touch with the builders of houses, so that the houses could be piped as they were built, and the competition from electricity was such that the canvassing and advertising expenses tended to increase all the time. For all these reasons it would be impossible to get the cost of gas in an outside area down to the level of the cost in an inside area.

The reasons for the passing of the Gas Regulation Act, 1920, and the Gas Undertakings Act, 1929, were gone into, and the point was emphasized that under these two Acts a gas company was not to be penalized by a downward revision of price merely because there had been an increase of output and a consequent decrease in cost of manufacture. The principle that a gas company was entitled to benefit from the results of decreased costs due to increased consumption arising from the company's own efforts was recognized in the Act of 1929.

ADVANTAGE OF MULTIPLE BASIC PRICES.

Figures were then placed before the Committee in the form of tables indicating the advantage of multiple basic prices over a single basic price. The incentive to a company to push the sale of gas under multiple basic prices for each area was stressed, and it was shown, according to the example taken, how there would be a benefit to the shareholders, the consumers, and the employees, whereas under a single basic price there might conceivably be no such benefit, although the shareholders would get their minimum dividend.

Mr. WILLIAMS (a member of the Committee), on the question that a gas company should not be penalized as to price because there was an increase of output, and that it should benefit as the result of its efforts, asked whether it was claimed that all increase in consumption was due to effort on the part of the gas company.

Mr. *White* said it was extremely difficult to get business today without a great deal of effort.

Mr. OSWALD LEWIS (member of the Committee) put the case of a factory already taking a large quantity of gas but requiring much more in order to cope with increased business. Could the gas company claim that that business was due to its efforts?

Mr. *White* said undoubtedly the decision of such a factory to use more gas would be influenced by the service already given. The Committee would probably be surprised if they knew the extent to which factory owners asked for the advice of gas undertakings on the most suitable application of gas to their particular businesses.

CROSS-EXAMINATION FOR BOARD OF TRADE.

Mr. WROTTESLEY opened his cross-examination on behalf of the Board of Trade by stating that in the Bath case the outside authorities were not represented at the inquiries, and that it was left to the Board of Trade to look after their interests.

Mr. *White* said he clearly understood the outside authorities had been advised on the matter and had decided to accept what was put before the Board of Trade.

Mr. WROTTESLEY replied that his instructions were that the outside authorities could not afford to obtain the necessary expert assistance.

Speaking of the return obtained by gas companies, Mr. Wrottesley pointed out that there was a practical certainty of 5%.

Mr. *White* replied that that was on the ordinary capital, and that even in present circumstances he regarded it as on the low side.

Mr. WROTTESLEY reminded witness that in dealing with the Gas Industry he was not dealing with an ordinary commercial venture but an Industry working under the ægis of Parliament and permitted to raise its prices to ensure a 5% dividend. There was no competition as between gas companies, and the companies had many other privileges which an ordinary commercial undertaking did not have. Moreover, when Parliament had given a basic price it had fixed the figure at a higher level than the ruling charge for gas.

Mr. *White* would not agree with this latter suggestion, although he agreed that that view was usually put forward by the gas companies when asking for a basic price. In the case of Sheffield the basic price was fixed below the price actually being charged. His own view was that the basic price should be fixed on the basis of the fair charge at the time the application was made.

It was then put to Mr. White that in regard to some details of the cost of supplying an outer area, the cost does vary in inverse ratio to the increased consumption.

Mr. *White* agreed that, up to the capacity of the trunk main, that item of cost would vary almost exactly in inverse ratio to the consumption; but then came the time when the main had to be increased.

Mr. WROTTESLEY then asked if Mr. White thought it fair that the company should be rewarded, over and above the basic dividend, for increases in consumption in outer areas, seeing that the consumers came to the gas company.

Mr. *White* said he most certainly did, because the consumer had the backing of the gas company and was assisted to use gas in the most effective and economical manner. There should be remuneration for that in the outside areas just as there was in the inside areas.

In answer to further detailed cross-examination,

Mr. *White* emphasized that in the outer areas the cost of maintenance and repairs was very much higher.

Mr. WROTTESLEY retorted that this depended on how and where the mains were laid.

Mr. *White's* reply was that modern concrete road construction was the same in, say, Chippenham as it was in Bath, and from that point of view the cost of maintenance in the outside areas was not likely to be less than in the inside areas.

In his re-examination of Mr. White,

Mr. TYLDESLEY JONES brought out the fact that in the Bath case the basic price asked for Bath was the selling price of gas, which was 5·5d. per therm, whereas the Board of Trade suggested a basic price of 6·2d.—to apply to the inside and outside areas—and it was this to which the Bath Corporation objected. He also made the point that an unduly high price to the consumer was dealt with in another way and did not come before the present Committee.

Capt. PEAKLE asked if there had been any cases of gas companies failing to earn their basic dividends.

Mr. *White* said that during the coal strike one or two companies had to draw on reserve to pay their basic dividends. Although circumstances might arise which would prevent a company paying its basic dividend, he did not think that a properly managed company should fail to do so, in the absence of special circumstances.

Answering Mr. WILLIAMS,

Mr. *White* said the reason for the basic price being fixed below the price of gas in Sheffield was because of the intention of the Sheffield Gas Company to buy coke oven gas, and that cheaper gas supply, he believed, was the dominating factor in that case.

Mr. WILLIAMS: And despite that, there has been excess of profits over the minimum profits for the past nine years. Surely, the basic dividend of 5% was fixed as the return to the company for its effort and initiative. Is it suggested that without some further return there will be no initiative and no effort?

Mr. *White* replied that the Board of Trade and Parliament were satisfied that the basic price had served a useful purpose from the point of view of the public and also the companies.

Mr. WILLIAMS suggested that the public did not agree that

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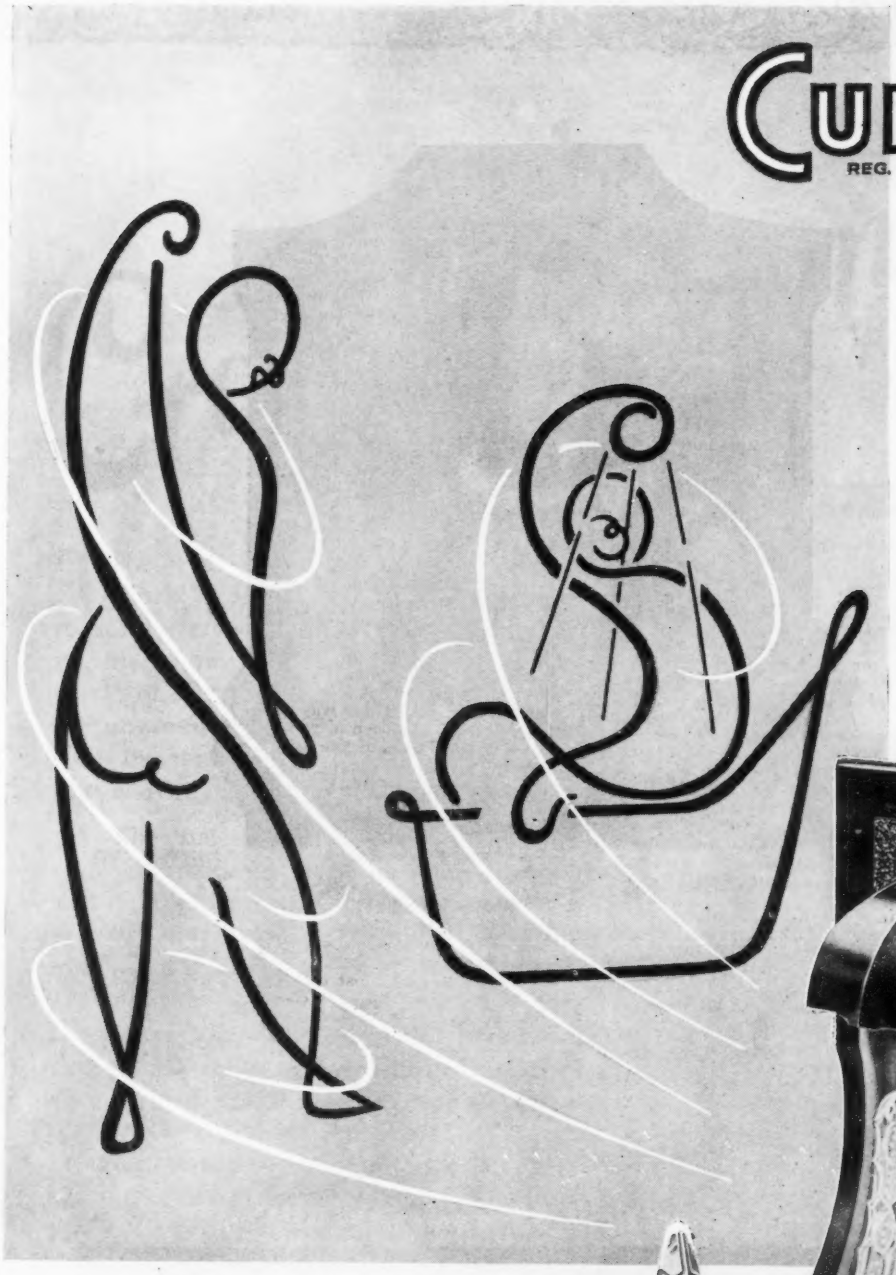

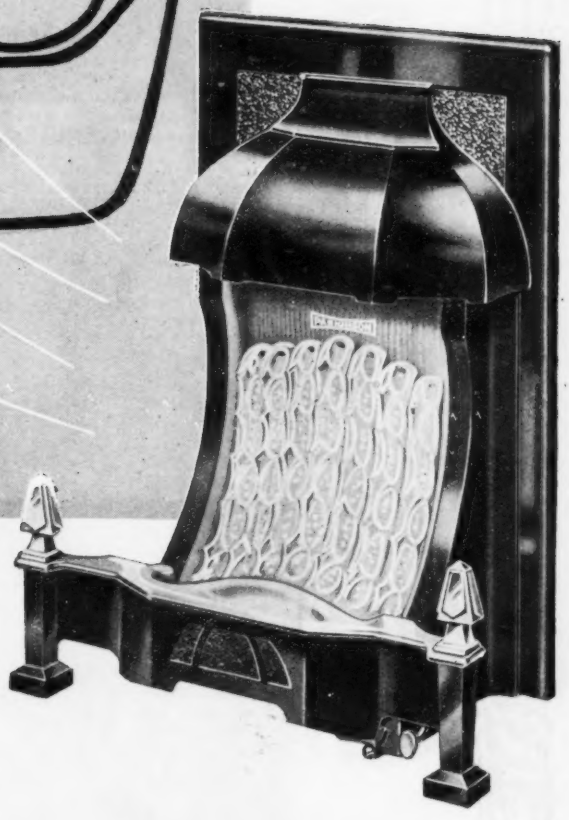

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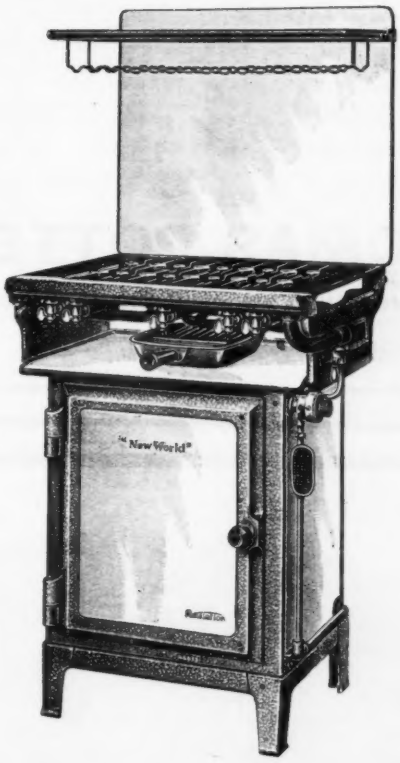

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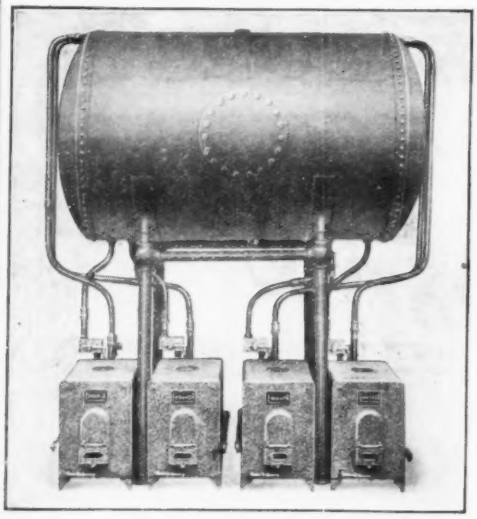

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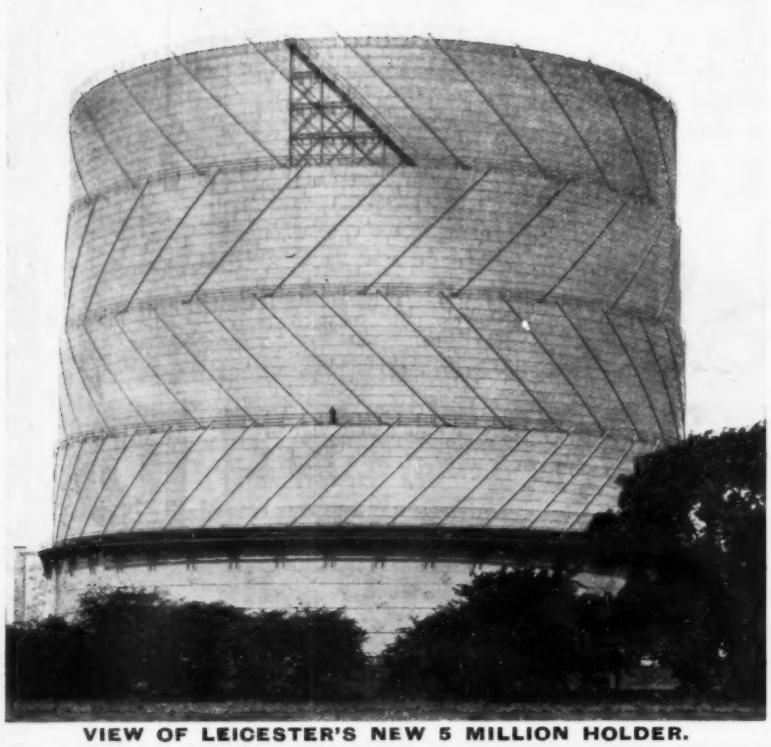

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profits should be made primarily and service should be considered secondarily.

Mr. *White* replied that that was not the policy of the gas companies.

The CHAIRMAN put it that in any business they never found the costs reducing in inverse ratio to the increase of consumption.

Witness agreed, as he also did with the suggestion by the Chairman that one of the most effective stimuli to decreasing costs was competition.

EVIDENCE OF MR. GEORGE EVETTS.

Mr. *George Evetts,* Consulting Gas Engineer, was then called on behalf of the National Gas Council and spoke of the part he has played in advising, principally, companies in regard to the basic price system. He added that Chippenham, in the Bath case, was advised by a well-known Consulting Engineer, and as the result of that advice decided not to oppose the proposals put before the Board of Trade for multiple basic prices. He disagreed with the contention put forward on behalf of the Board of Trade that the costs of supplying in an outer area could be divided into two items, one of which was the average cost in the inner area. In cases where there was a trunk main for supplying a specific outer area, the cost would vary inversely as the increased consumption, but as the demand increased and boosting became necessary, the cost would increase, and the cost of boosting might be more than the extra consumption brought in. The capital per million was always higher in an outer area than in an inner area, and there were also the items of management, maintenance, service to consumers, and so on, which resulted in there always being a permanent element in the case of a differential. Pointing out that there are 439 gas companies in England and Wales, Mr. Evetts said that 170 had been authorized to charge differentials. There were 81 local authorities in England and Wales with differential powers, and in Scotland there were 22. Since 1919 the Board of Trade had made 130 Special Orders with differentials and 38 Special Acts had been passed applying to gas companies in which powers to charge differentials had been given. In all these cases, with the exception of 10, the powers were permanent. In other words, the differential charge had been optional on the part of the company, but there was no limit of time.

Dealing with what had been termed fortuitous increases in consumption in outer areas which called for no effort on the part of companies and therefore should give no reward to the company, Mr. Evetts mentioned the case of Welwyn Garden City. When this was being developed the question of a gas supply was discussed. Welwyn Garden City lay on the boundaries of the Welwyn Gas Company and the Hatfield Gas Company, and it was decided that the best thing to do would be for the two Companies to amalgamate. That was accordingly done. There was a relatively large residential and industrial population in the Garden City, and when the two Companies amalgamated their combined output was 32 million c.ft. per annum with a capital cost of £770 per million. The supply to the Garden City increased the output by another 30 million c.ft. at first, and the capital cost of supplying that gas was £1730 per million. Later a further 20 million c.ft. was added to the supply, and the capital cost of this was £1120 per million. That justified a differential of 2½d. per therm in Welwyn Garden City. If increased business in an inner area, added Mr. Evetts, was not a reason for a revision of price—and it was not—neither should it be a justification, as such, for a revision in an outer area. In the case of Welwyn Garden City there was a considerably increased output, but surely the Company was entitled to some reward for what it had done in bringing the supply there.

Mr. WROTTESLEY suggested that the reason for the very considerable increase in capital expenditure in the Welwyn Garden City case was that the money was expended at the period of dear capital and dear costs generally just after the war, while the previous expenditure by the two Companies was pre-war expenditure.

Mr. *Evetts* said the new capital expenditure was after the period of very high prices following the war.

In answer to further questions, he agreed that in regard to the Bath outer area he had stated at the Board of Trade inquiries that in respect of about two-thirds of the extra cost there would be an inverse reduction with increase in consumption; and he adhered to that.

Mr. WILLIAMS put some questions directed to the position of a gas company in regard to extra profits made through purchasing coke oven gas.

Mr. *Evetts* said that in such a case he would recommend the whole position being investigated and a reasonable balance struck between the company and the consumer.

Mr. WILLIAMS: Do you suggest the consumer should bring the case to the House of Commons?

Mr. *Evetts* said he did not, but when the company came up for a revision of price it was a factor which should be taken into account.

Mr. WILLIAMS: But the company might not come up for revision for many years, and in the meantime it would be making excessive profits.

Mr. *Evetts* said he could not conceive a gas company continuing in such circumstances, and not coming to Parliament for a revision of its basic price. As a matter of fact, the case would fall directly within the Board of Trade clause dealing with revision.

Mr. WILLIAMS: That means that the local authority or a number of consumers or the Board of Trade would have to take action.

Mr. *Evetts:* Yes.

MR. ARTHUR VALON'S EVIDENCE.

Mr. *Arthur Valon,* Consulting Gas Engineer, then gave evidence for the National Gas Council and said that he had advised local authorities to a very large extent concerning the basic price system, and he had been in the habit of looking at the matter from the consumers' point of view. His considered view was that a multiple basic price system was the fairest and simplest because what he was interested in was seeing that the system conduced to efficiency and was fair as between one body of consumers and another. With the suggested single basic price there was an inducement to the gas company to give a reduction to consumers who were least entitled to it; and although speaking generally he would not suggest that the Gas Industry as a whole needed close regulation, there might be instances where it was necessary. The multiple basic price system, however, prevented such companies from misapplying their powers.

In cross-examination, Mr. Valon, who advised the Bath Corporation in respect of the Bath Order, said he was first called in after the objections had been lodged, and he had subsequently advised the Corporation to agree to the multiple basic prices, which included a basic price in Bath equivalent to the selling price of gas.

Answering members of the Committee, Mr. Valon said that with a multiple basic system there was an inducement to the company to make reductions in prices where reductions in costs in the individual areas made this possible, whereas with a single basic price there was the inducement to the company not to make a reduction which applied to the whole area, as it must do.

Moreover, with a single basic price there might be a greater tendency on the part of the company to keep the differentials at their maximum. The extension of the multiple basic price system would, he believed, tend to greater uniformity in price throughout the country generally.

EVIDENCE OF MR. WILLIAM CASH.

Mr. *William Cash* was the last witness called on behalf of the National Gas Council. He spoke as Chairman of the Sub-Committee of the National Gas Council which considered this matter, and also as Chairman and Director of a number of Gas Companies. Mr. Cash said he had been consulted by the Bath Gas Company when this question of a basic price was first dealt with, and after considering the position he had advised that the multiple basic price should be applied. He held the view that such a system would clearly lead to greater uniformity of charges throughout the country. The single basic price system would result in reductions throughout the inner and outer areas, and not in reductions in particular areas where the conditions warranted it. That being so, gas companies would hesitate before making such reductions as they otherwise could. As to the suggestion that gas companies put their shareholders before service to the consumer, Mr. Cash said such a policy would be madness. Incidentally, he added that it might seem curious that whereas he was advocating the basic price system, none of his own companies worked on that system. The reason for that was the delay that took place before basic price Orders could be obtained. The Bath Company had been three years getting their Order, and it involved a considerable amount of expense.

Speaking on the point that gas companies do not have to make effort to secure new business, Mr. Cash called attention to the considerable amount of research work carried out by the Industry with the object of improving the efficiency of gas and gas appliances, all the results of which were placed at the disposal of consumers. Again, large sums of money were expended by gas companies in order to induce business. For instance, in the case of the St. Helier's Estate in the Croydon Company's area, a sum of £20,000 was expended in mains, piping houses, &c. The same thing applied in the case of the Bournemouth Company, which was now extending its operations along the coast and linking up Christchurch with places beyond. All this involved large sums of money in mains, advertising, canvassing, lectures, demonstrations of latest appliances, and so on. It must be remembered that when a manufacturer inquired about gas he also at the same time inquired about electricity and oil, and it was then that the gas company came to grips with the consumer and had to make a great deal of effort to secure the business. In the case of a Departmental Store in Bournemouth, for instance, for central heating, &c., gas was in severe competition with oil, and though gas secured the business it meant a considerable amount of effort. Consumers were not hurt if higher dividends were paid and the price was reduced, unless the view was taken that a gas company was not entitled to any reward for the work it did. As things were at present, however, the staffs and employees of gas companies were imbued from top to bottom with enthusiasm for giving service to the consumer, knowing that only by doing so could the company be successful.

Mr. WROTTESLEY, making the final speech to the Committee and summing up on behalf of the Board of Trade, said it had been suggested that he had implied that gas companies were making exorbitant profits. He had not intended to give such impression, if he had done so. The Board of Trade trusted the Gas Industry, which was no worse and no better than any other good English industry. What the Board was trying to do was to devise a code which did the things it set out to do and which Parliament had intended it should do, when it was first instituted. It was quite wrong, and a wholly false view, for the National Gas Council to say that any Committee of Parliament had gone into this question on its merits. What was said in the Bath case was that in view of the agreement that had been come to, that Order was not one upon which

there should be a general discussion on the whole question. It had also been said that the Board of Trade had been subject to rapid fluctuations of opinion with regard to this question of basic prices, but he failed to understand what was meant by that, unless it meant that the conversion to its present views was not genuine. A discussion of this kind was not advanced by personalities at the expense of the Board of Trade or the gas consumer. The Board of Trade here was making an endeavour to resolve this matter on lines of principle. The basic price principle was one which presented great advantages, and the principal advantage was that, whereas the Gas Industry had grown up in the past by supplying light to small consumers, it now had the opportunity of supplying heat to large consumers in large quantities, a completely different class. But while it was only right that Parliament should assist the Gas Industry to do this, surely it was only fair to say that it should not be done at the expense of the old consumers to whom the remuneration of the capital invested in the Industry hitherto had been due. Apparently the argument by the National Gas Council was that they had gone too far along the road, and that no change should be made. As a matter of fact, looking at the legislation with regard to the basic price principle, it was evident that Parliament did not feel too comfortable about it, and therefore the clause was inserted providing for revision from time to time. It was true that many of the companies working under the basic price system were the large companies which could be trusted to carry on their businesses with due regard for the consumers as well as the shareholders, but the point at issue in the present inquiry was what was the proper logical legislation to apply in this respect throughout the country.

MODEL FORM OF LEGISLATION.

The Committee was really being asked to settle the model form of legislation in regard to this matter, and what was the right principle to apply. The Board of Trade did not become aware of the dangers of the multiple basic price system until some time after the system had been granted by Parliament, otherwise there would have been reports from the Board of Trade pointing out the unfairness and the danger of it, and the whole matter would have been brought up much earlier than it had been. It was essential in changing from the sliding-scale system to a basic price system to be certain that conditions were not introduced which would be unfair to the consumers as a whole, and particularly to the small consumer, in view of the fact that the dividends might be based not on the price paid by the small consumer but on an average which might include one supply constituting 50% of the total supply. Therefore greater care was needed to ensure that the small consumer was not victimized than was necessary under the sliding-scale system. The old system had gone, and there were high State reasons that it should, in order that they should encourage the use of their own fuel rather than imported fuel; but at the same time there must be adequate safeguards to the gas consumer.

The South Metropolitan case was the first in which a basic price was allowed, but in that instance there was no differential, and Parliament had not yet had an opportunity of giving a decision upon a basic price in its relation to outside areas, and it had never been contested until the Bath case came up for consideration. It had been suggested that on a system of multiple basic prices a gas company would be encouraged to reduce the higher prices in the outside areas, but it was also seriously suggested by Mr. Cash and the other witnesses for the National Gas Council that the gas company should be given a prize for doing that. It was inconceivable to him that companies should be rewarded by an extra prize in such circumstances, and he hoped the day was long distant when Parliament would hand out prizes for such conduct. Personally, he did not think gas companies really wanted that incentive, and there was little doubt that the higher prices in outside areas would be reduced as the demand developed. Undoubtedly the Gas Industry deserved well of the country and of the Board of Trade; on the other hand, he believed it would be agreed by the Industry that the Board of Trade was a very benevolent Department so far as the Gas Industry was concerned.

The only other reason advanced for the multiple basic price was that it assisted amalgamations. If that was to be the price for amalgamations, then he at once said it was too high a price, and it was a price which would be very difficult for anybody to justify the payment of, because it came out of the pockets of the consumers. There was no excuse for amalgamations under the basic price system unless the consumer was to benefit. In the view of the Board of Trade the single basic price should hold the field, because it was not capable of the abuses which the multiple basic price was. It was not suggested that the single basic price could not be improved. As a matter of fact, there were two or three lines of approach with which he would not trouble the Committee at the moment. For instance, there might be some means of evaluating the permanent element in differentials; but so long as there was as much as two-thirds of the cost in an outer area which decreased with the increase in consumption—as admitted by Mr. Evetts—then he contended there was a profit falling into the laps of the gas companies by way of extra dividend at the expense of the smaller and poorer consumer.

Mr. *Askew*, for the National Gas Council, interposed that this two-thirds only applied to the Bath case to which Mr. Evetts was speaking.

Mr. WROTTESLEY said the proportion might be more or less in other cases.

Capt. PEAKLE (member of the Committee) said he understood that basic prices could be revised.

Mr. WROTTESLEY said they could be revised on application to the extent of a rise or fall in costs, but not on the question of increased consumption.

Capt. PEAKLE then asked if Parliament could reduce dividends.

Mr. WROTTESLEY replied that of course Parliament could do anything, but he could not visualize it reducing dividends, because by that time the capital would have been raised on the basis of the previous Parliamentary powers obtained. He had never known a Parliamentary Committee to reduce dividends, and it would require a General Act of Parliament to do it. At the same time, it was only fair to the Gas Industry to say that capital was often raised on the basis of the auction clauses which rendered the return to the shareholder actually less than the amount allowed by Parliament, because £120 might be paid for £100 of capital.

The CHAIRMAN announced that the Committee would make its Report in due course.

Colonial Gas Association.

The Forty-Fourth Annual General Meeting of the Colonial Gas Association, Ltd., was held at Melbourne, on Wednesday, Oct. 5, 1932—Mr. P. C. HOLMES HUNT, M.Inst.C.E., Chairman of Directors, presiding.

The CHAIRMAN, in moving the adoption of the report and accounts, said:

Last year when addressing you I referred to the fact that the continued progress in gas sales had had a check which your Directors thought was temporary. There has been a further decline in sales, as mentioned in the Directors' report, but, I am pleased to say, there are some signs of improvement at a number of our important Stations. The sales of gas by the Association's Works show a decrease of 6·36%, upon the sales for the preceding year, and the sales by Subsidiary Companies a decrease of 8·03%. Consideration is being given to revisions of the price of gas at the various Stations of the Association. In making these revisions, your Directors appreciate the importance of departing from the old flat-rate method of charge, and of adopting some sliding-scale method.

The revenue from the sale of gas has been affected by the reduced quantity sold and also by price changes; in fact, the gas revenue is down by some £20,000. The miscellaneous revenue is lower by £2500, but this is satisfactory considering that there was a lesser quantity of residual products made, due to the smaller quantity of coal used, and that the returns from some of the Subsidiary Companies were lower. The increasing competition from bitumen may be gauged from the facts that 1594 tons were imported into Australia in 1922, but for the year 1931 the quantity was 63,528 tons, while for 1930 the figure was no less than 110,190 tons.

The net profit last year was £81,389 (being the balance of the revenue account less interest). This compares with £75,873 for the present year—the reduction in net profits being £5500. Interim dividends were paid in April last, and the final dividend recommended on the ordinary shares will make 6% for the year.

The next item to which your attention is drawn is the fact that it is necessary to set aside £13,500 for Australian income-taxes on profits earned to June 30, 1932. The sum named is equal to more than 2% on the ordinary share capital of this Company, and represents 6d. per 1000 c.ft. of gas sold. The burden of State and Federal taxation has grown enormously, and the amendments to the Federal Taxation Acts for the years 1930 and 1931 increased the burden falling upon this Company's revenue. The Directors have been able to recommend the transfer of £1000 to the credit of the reserve fund. In the balance-sheet, the reserve fund appears to be £9000 better than last year, but this year's figure includes provisions for income-taxes not assessed at June 30. The amount of undivided profits to be carried forward—viz., £22,697—is some £200 better than last year.

Again I would record the Directors' appreciation of the work done during the year by the Managers of our various Works, and their staffs; also by the Secretary and his staff, and by the Queensland and London Offices.

I have pleasure in moving:

"That the balance-sheet and revenue account for the year ended June 30, 1932, together with reports of Directors and Auditors, be received and adopted."

Sir ARTHUR ROBINSON seconded the resolution, which was carried unanimously.

The CHAIRMAN then moved the following resolution:

(*a*) That a dividend at the rate of 8% per annum (less interim dividend of 4% for the half-year ended Dec. 31, 1931) be paid on the preference shares; and
(*b*) That a dividend at the rate of 6% per annum (less interim dividend of 3% for the half-year ended Dec. 31, 1931) be paid on the ordinary shares; and
(*c*) That £13,500 be set aside for Australian income-taxes on profits earned to June 30, 1932; and
(*d*) That £1000 be transferred to the credit of the reserve fund; and
(*e*) That the balance, approximately £22,697, be carried forward to the next account.

Sir STEPHEN MORELL seconded the resolution, which was carried unanimously.

THE "JOURNAL" TECHNICAL RECORD

Which contains Reports of Meetings of Gas and Allied Associations

Modern Gas Heated Equipment for Industrial Drying Processes*

By W. HIND (Industrial Gas Engineer of the City of Coventry Gas Department).

New fields are continually being opened up for the use of gas in various directions. It is my intention to review the use of gas applied to drying processes only. This field appears to provide scope for expansion, though competition from electricity, oil, and steam heating from coal fired boilers must be faced. There are many and varied drying operations necessary to-day, each process differing in some respect and probably requiring specially designed equipment.

Drying operations usually depend upon air circulation, due to the fact that air will readily absorb moisture from other materials. Its capacity of holding moisture increases greatly with the increase in temperature. It is surprising to find the amount of moisture in materials, some of which have a fairly solid appearance and still contain up to 90% moisture.

TABLE I.—*High Temperature Drying.*

APPROXIMATE DRYING TEMPERATURE FOR VARIOUS PROCESSES.

Process.	Temperature ° F.
Core drying	500
Stove enamelling (varnish and paints, &c.)	250–500
Sweating sheet steel parts	350
Mould drying	400–700

TABLE II.—*Low Temperature Drying.*

APPROXIMATE DRYING TEMPERATURE FOR VARIOUS MATERIALS.

Material.	Temp. Required. ° F.	Material.	Temp. Required. ° F.
Artificial silk	70 90	Metal parts	150–400
Apples	160–180	Meat (beef, pork, &c.)	105
Bacon	70–120	Malt	100–220
Barks	80–220	Nuts	90–140
Bathing suits	120–180	Oilskins	120
Beans, peas, &c,	130	Overalls	120–180
Bedding	150–190	Paper, glued	160–300
Blankets and flannels	120	Paper, treated or dyed	150–200
Blacklead	200	Pasted ribbons	160–200
Barrels	180–190	Pills	80–180
Bottles	150	Pipes for smokers	70–150
Bricks	90–200	Photo prints	90–110
Cereals	110–150	Photo negatives	90–110
Cellulose	100–150	Photo films	90–110
Clothes	100–180	Pottery	120
Cardboard	140	Potatoes	170
Casein	95–105	Printing inks	70–300
Coffee	160–180	Rags	120–180
Copra	120–140	Ramie fibre	140
Cotton waste	200	Rice	140
Drugs	80–400	Rubber	80–90
Felt hats	140–180	Rubber waste	140–160
Feathers	150–180	Shoes	100–200
Furs	150–190	Soap	100–150
Fish	68–93	Starch	100–200
Flax	120–130	Straw	120
Glassware	150–250	Sugar	150–200
Glued tapes	160–300	Sweets	120
Glue	70–90	Tea	180
Gut	150–200	Tobacco-leaf	85–100
Hair goods	150–190	Tobacco-stem	180–200
Herbs	80–220	Textiles	140–180
Hops	120–180	Varnish	110–120
Hemp	200	Wheat, corn, &c.	130–180
Ladies' hats, glued	140–180	White of egg	105–113
Leather	85–100	Wood, soft	175
Leather goods	100–200	Wood, hard	90–125
Lumber	70–150	Wood, three-ply	85
Linoleum	75–100	Wagon wheels	70–160
Matches	80–85	Wool	100–200
Macaroni	110–150	Yarns	120–160
Mattresses	100–180	Yeast	122

Each drying problem requires individual consideration in choosing the type of equipment to perform the drying operation. The first factors to be considered are as follows: (1) The proper drying temperature for the process. (2) The amount of moisture to be extracted. (3) The rate of air movement to remove this moisture. (4) The time required for the complete drying operation.

The drying temperatures for a range of materials are given in Table I. (high temperature drying) and Table II. (low temperature drying). To determine the amount of moisture to be extracted, a sample of the material should be dried at the given temperature. The sample should be weighed before and after the drying operation. The difference in weight represents the moisture extracted. The time required for the drying operation depends upon the maximum temperature that can be used and the rate of air circulation. Too high a temperature will cause skin drying while moisture is still held inside the material. When this moisture eventually bursts through, blisters are caused on the surface of the material. Other factors in connection with the process which the material is subjected to help to determine a satisfactory temperature to work at. Generally speaking, the figures in Tables I. and II. represent standard practice.

Classification of Gas Heated Drying Equipment.

The heat application for drying usually takes place by convection and radiation, though in the case of drying presses, &c., heating by conduction is performed. Generally, the low temperature drying equipment takes the shape of a drying room, the high temperature drying operations being usefully performed by use of an oven of the conveyor or the box type. The general classification of the equipment could be made under five headings, as follows:

Heating Equipment.	Result Given.	Air Circulator.	Application.
1. Direct fired external air heater without flue	Products of combustion and heated air mixed	Blower or exhauster	Conveyor enamelling, paint drying, core drying, &c.
2. Indirect fired external air heater with flue	Heated air only	Blower or exhauster	For treating chemicals, rubber compounds, &c.
3. Direct fired burners	Burning open inside room or oven	Natural draught or propeller fan when required	Box ovens, Cox's combustion blowpipes, &c.
4. Indirect fired burners with flues	Burning inside room or oven, but with flue products drawn off separately	Ditto	Radiators in drying rooms. Heating coils in ovens or treble cased ovens
5. Gas fired boiler	Heat applied by radiators or pipes	Ditto	Low temperature drying rooms, ovens, and presses

The suspended unit air heater which circulates hot air inside a drying room is a useful piece of apparatus. Another type of heater gives complete automatic humidification. Any degree of relative humidity within a wide range may be obtained by merely setting the water level in the unit. Another type of drying oven gives a much shorter drying period by adding further quantities of oxygen to be circulated with the hot air.

Efficiency of Equipment.

It is advisable to endeavour to obtain the maximum efficiency from the gas consumed, with a view to meeting competition from other fuels and to give satisfaction to the consumer so that he may ask for further gas appliances besides drying equipment. High-class work produced by the gas heated equipment has a value which is hard to define in £ s. d., but goes a long way with the manufacturer in deciding upon the equipment. There are many points to watch in connection with the efficiency of the equipment. Four common points are as follows: Insulation, correct

* From a paper read before the Midland Junior Gas Association, Dec. 8, 1932.

space for drying, re-circulation, and automatic temperature control.

For high temperature drying equipment, insulation is very important. Ordinary sheet steel is useful for making special radiators of the indirect type; therefore, a large oven simply constructed of sheet steel for high temperature drying would act as a radiator giving off heat which should have been otherwise usefully applied. It is customary to have a double casing packed with insulating material for the ovens, and insulation behind the firebrick lining for high temperature air heaters. Any ducts conveying hot air should also be well lagged.

Excessive space in a drying room or oven is wasteful. The space allowed should be just sufficient for the placing of the work and to allow the necessary air circulation.

In converting existing drying rooms to gas heating much trouble could be avoided by blanking off any unnecessary space. For natural draught drying rooms some indication of the conditions prevailing before placing the heating equipment could be obtained by use of smoke bombs. Dead pockets or draughty places would be discovered and suitably remedied by the placing of the air inlets and outlets.

For equipment using high temperature air heaters, re-circulation of the hot air may retrieve up to 75% of the heated exhaust air. In many cases it is possible to pass this used air through the heater again, burn up any volatiles given off from the work, and provide re-heated air cleansed and purified ready to be used again.

Automatic temperature control adds a necessary refinement to drying equipment. For box ovens, &c., a direct acting rod type thermostat is useful. This thermostat can be set and sealed to act at a given temperature or can be provided with an adjustable head for a range of temperatures as used on a gas cooker. For drying soldered work the thermostat acts as a safety device to prevent overheating of the work and melting the soldered joints. Remote control and various other types of thermostats are applied to the different processes.

Heat Calculations.

Some idea of the gas consumption for a new appliance is necessary to determine meter and gas supply pipe sizes. There are so many variable factors to be considered that calculations for this work can only be regarded as approximate.

Heat to work, B.Th.U. (including conveyor or racks)	= Weight of work in lbs. × specific heat of work × temperature rise, ° F.
Heat to walls, B.Th.U.	= Weight of walls × specific heat of walls (mean temperature-room temperature), ° F.
Heat radiated through walls, B.Th.U. per hour	= Inside area of oven × loss per hour, B.Th.U. per sq. ft.

Temperature Difference (Oven Temperature-Room Temperature).

° F.	100	200	300	400	500	600
B.Th.U. loss per sq. ft. per hour, 2 in. insulation	25	35	55	90	125	150
3 in. insulation	20	30	45	70	95	115

Heat absorbed by air, B.Th.U. =

Weight of air, in lbs. × specific heat of air (final temperature-initial temperature), ° F.

1 lb. of air at 60° F. = 13·06 c ft.

Average specific heat of air for the range = 0·24 B.Th.U. per lb.

Conveyor Enamelling Drying Ovens.

This process consists of the evaporation of the thinner drying oils and baking of the enamel on the surface of the material. The drying oils require an oxidizing atmosphere which gives a good glossy finish to the material.

Several installations of this type are installed at Coventry; the one shown in Figs. 1 and 2 is in use at the works of Coventry Bicycles, Ltd., for enamelling cycle parts. The oven is fitted with a separate air heater of the direct fired type. Two gas burners fire into the brick lined heater, through which air is drawn to be heated before passing into the oven. The incoming air passes through a filter to eliminate dust, and spoilt work is unknown in this oven, a high-class finish always being given. Should dust settle on the dipped enamel work, the specks of dust are magnified when baked on and spoil the surface of the work. An exhauster blower is fitted between the air heater and oven, and this blower delivers the heated air for distribution in the oven. A certain amount of hot air is re-circulated after being purified by passing through the heater again, and a small percentage of the used hot air is discharged direct from the oven near the feed end of the oven. The work is suspended from a conveyor to be dried and baked as passed through the oven. For an average throughput of work at a temperature of 450° F., 1050 c.ft. of gas is used per hour.

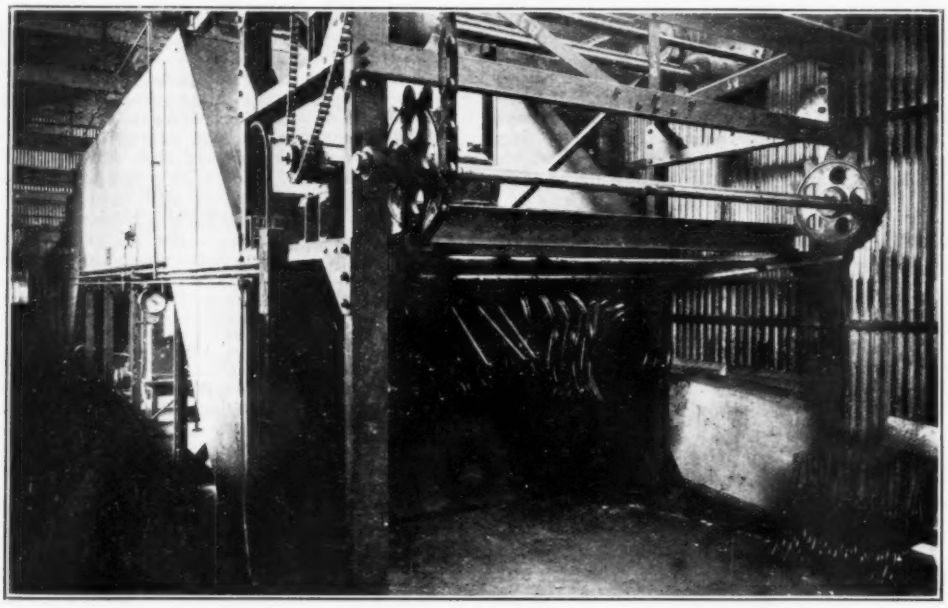

Fig. 1.—Conveyor Enamel Drying Plant at the Works of Coventry Bicycles, Ltd.

A constant temperature is maintained automatically by the use of a remote control thermostat, and a temperature recording instrument is always in use, giving a record chart for every day's working.

Continuous Chassis Drying Oven.

Hot air at a temperature in the region of 180° F. is circulated for drying chassis as shown in Fig. 3. In this case the air heater is mounted on the top of the drying stove, two gas burners being used. The air heater is firebrick lined of the direct fired type. The chassis are sprayed

immediately before entering the oven and are dry ready for the assembly when discharged from the oven.

Core Drying.

The usual procedure for core drying is to use a direct fired box or brick built oven. This method has proved satisfactory, though in many cases the addition of a thermostat is a decided advantage. Where mass production of cores is demanded conveyor ovens are necessary. Six gas fired conveyor ovens are installed in one foundry at Coventry, the largest being 100 ft. long by 4 ft. wide by 6 ft. high.

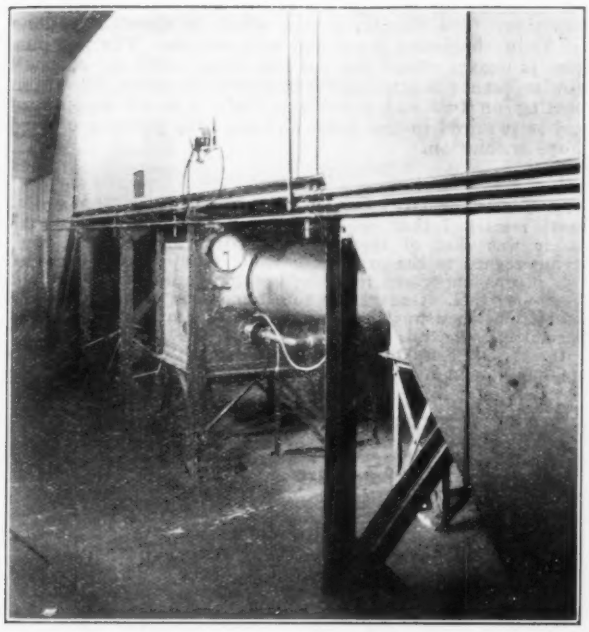

Fig. 2.—Close-up View of Conveyor Enamel Drying Plant at the Works of Coventry Bicycles, Ltd., showing Air Heater, Burners and Thermostat, &c.

Development is now taking place of a continuous double strand vertical conveyor oven. The strands of the conveyor are about 10 ft. apart and the cores are rested in cradles suspended from the connecting bars. With the vertical oven the cores travel four times the height of the oven, the flow of heated air being directed in a similar path before being discharged from the oven. Gas fired ovens of this type are in successful use in America.

Mould drying is another useful application for gas; the operation can be performed by using ovens, blowpipes, or bunsen burners. With bunsen burners improvement was made for drying moulds in pits. A bucket burning solid fuel used to be left inside the mould during the night; this had the effect of drying the mould unevenly. Gas burners were made to suit the moulds and a very small flame burning throughout the night gives a uniformly dried mould.

Bacon Drying Room.

Bacon is subject to a drying process, removing about 8% of moisture in a period of 2½ to 3 days. Two rooms were fitted for this process with special gas radiators, having flues to take off the products of combustion. Existing rooms were reconstructed, two of the walls being built of 9 in. brick and the others double woodwork with air space and asbestos sheet facing. Air inlets were made near the floor fitted with shutters for adjustment, and an open propellor fan was installed near the ventilator in the roof. The burners inside the radiators are the luminous type controlled by an air thermostat fitted in the centre of the room. This thermostat is very sensitive and keeps the room at a constant temperature of 80° F. When the temperature tends to drop, the burners are automatically turned full on, and after the temperature has been recovered the burners are automatically turned down again to a minimum flame. An illustration of the bacon drying room is given in Fig. 4.

This installation works very well, one of the chief features being the automatic temperature control. The previous method of heating was by means of stoves fired by solid fuel, which required attention such as banking up for the night, and caused a wide fluctuation in temperature. With the present method the radiators are simply lighted and the automatic control keeps the room at the desired temperature over an indefinite period.

Drying Oven for Clock and Watch Parts.

A batch of ovens for drying clock and watch parts had been heated by hot water pipes, a naked light not being permissible owing to the cellulose spraying. The boiler failed, and a scheme for gas heating was decided upon. Two 3 in. diameter coils were fitted inside the oven and a burner firing into each coil was fitted in the next room. Asbestos composition flue piping was used for the coils with the exception of the portion near the burner, which was made of ordinary 3 in. wrought iron gas pipe. Most of the work is dried in the oven at a temperature of 150° F. with the door open. With the door closed a temperature of 250° F. can be obtained in about twenty minutes' time. The coil in one side of the oven can be seen in Fig. 5. This installation was designed by the Birmingham Industrial Research Laboratories.

Special Towel Drying Equipment.

Special equipment was designed to meet the need of drying about thirty towels without removing them from

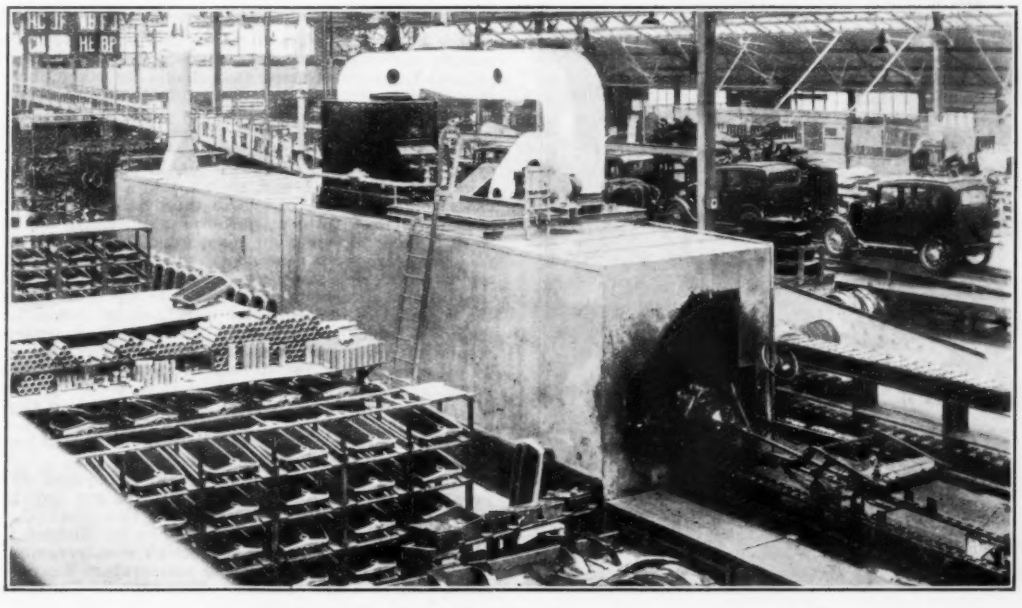

Fig. 3.—Over-all View of Chassis Drying Oven at the Standard Motor Works.

Fig. 4.— Gas Heated Bacon Drying Room.

the hooks in the bathroom. The radiators are not in use when the bathroom is being used, but are put into operation to take the dampness from the towels after use. The radiators fit close up to the wall, as shown in Fig. 6, and are heated by a series of small burners. A small air space is left at the bottom in the front of the radiator and the top portion under the towels is fitted with expanding metal panels. A baffle plate is fitted over the burners, and the cold air enters through the small space at the bottom to be heated before rising directly under the towels to perform the drying operation.

We have fitted drying cabinets for indoor drying of clothes. This gives a good warm air circulation which absorbs the moisture from the clothes. The discharging air before being passed into the room is reheated by a separate burner, which prevents moisture deposit on the walls or the windows. The cabinet is useful for hospitals, sports clubs, &c.

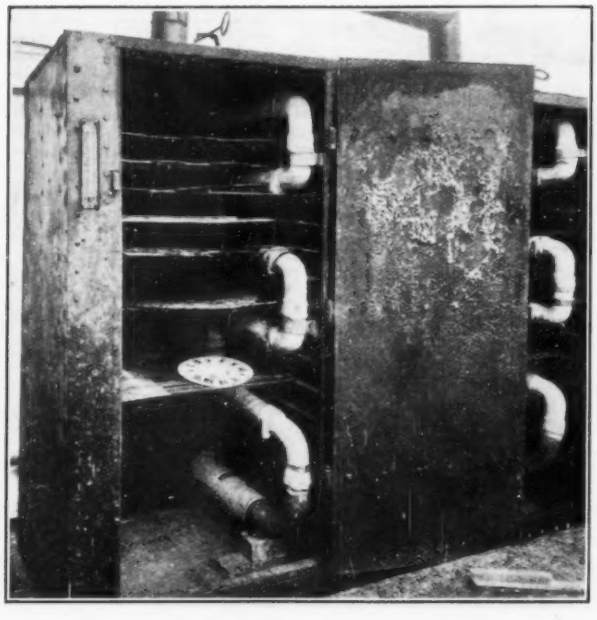

Fig. 5.— Cellulose Drying Oven.

Stereo Drying Press.

This method of drying is different from the foregoing methods which have dealt with heating by convection and radiation.

The stereo drying press gives heat by conduction, and operation is completed by the pressure applied to the platens of the press. A series of burners are distributed under the press; in this case only the stationary part is heated. A rod thermostat is fitted in the heated platen which gives automatic temperature control.

A machine for drying blue prints was recently put into operation. The circular drum, which is about 4 ft. long and 15 in. diameter, is covered with canvas. The wet blue print is drawn round the outside of the canvas. A small tabular burner is fitted in the centre of the drum, the drum rotating on two end bearings. Only a small amount of heat is required in the drum and the blue prints are dried in one revolution.

Discussion.

The PRESIDENT (Mr. F. A. C. Pykett, Coventry Gas Department) remarked that one of the principles outlined by the author was that of thermostatic control and lagging, and, having regard to the price of gas and that of other forms of fuel, it was important that the last ounce should be got out of gaseous fuel. One of the surest methods of obtaining the highest efficiency was the conservation of heat by lagging and thermostatic control.

Mr. W. N. SMIRLES (Industrial Research Laboratory, Birmingham), in moving a vote of thanks to Mr. Hind, said the

Fig. 6. - Special Radiator for Towel Drying.

author had clearly demonstrated that gas could be used economically for industrial drying processes, and he had also explained the various steps that should be taken, having regard to varied conditions, including wide ranges of temperature, to get satisfactory results. It was obvious that the conditions must be accurately controlled, and that this control could be obtained by scientific methods.

Mr. F. CAUDWELL (Shrewsbury), in seconding the resolution, said that Mr. Hind had shown there was definite scope for extension in the use of gas in this particular field, in spite of the competition from other forms of fuel. If the price of gas were a trifle higher than some other forms of fuel as applied to drying processes, his own experience was that many industrialists preferred gas because of its convenience. He believed that a good deal of business could be obtained for gas through the medium of experimental work and by demonstrating what could be achieved by gaseous fuel. He had secured excellent results in connection with the de-greasing of cookers, and also by equipment for the drying of sawdust, which had definite advantages over the method of drying by hot water pipes. Mr. Caudwell added that he was interested in the subject of apple drying, in which connection there was a great future for gas. Immense quantities of apples were wasted owing to lack of facilities for drying the fruit.

Mr. J. H. WAINWRIGHT (Halesowen) inquired at what temperature an oven for the enamelling of gas apparatus should be maintained; also the length of time that the apparatus should be left in. He added that in his district a good deal of enamelling was done in connection with perambulators.

Mr. HIND, in reply, said the temperature for ordinary stove enamelling in a box oven was about 350° F. There was no doubt that for drying processes gas was infinitely more convenient in use than other forms of fuel, and this fact seemed to be

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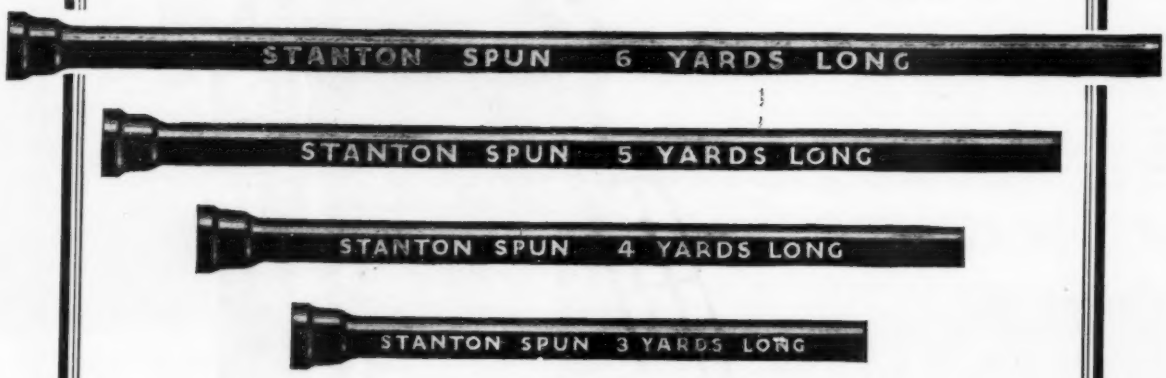

The Stanton Ironworks Company Limited Nr. Nottingham

DOMESTIC UTILIZATION OF GAS

The Principles Involved

By

NORMAN S. SMITH, B.Sc., Assoc.M.Inst Gas E. and R. N. LE FEVRE Assoc.M.Inst.Gas E.

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Second Impression

The authors commenced this book with a belief and an aim. The belief is that a knowledge of the *principles* of gas utilization is a *sine qua non* of effective salesmanship in the Gas Industry; the aim was to deal simply and logically with these principles. Quite definitely the result bears no relation to a catalogue of gas-using appliances, but it is hoped that, with this book as a first step, the reader will in some measure be fitted to interpret the mechanism of gaseous combustion, to differentiate between good and bad apparatus and good and bad installation, and to appreciate underlying reasons for modification in design. It is hoped, too, that the book will be of immediate service to the younger members of the Gas Industry who, keen on their work, are embarking on the various examinations which assist in establishing a useful career in the Industry. It should be of special utility to those in the Second and Third Years (S2 and S3) of the Institution of Gas Engineers' Major Course in Gas Supply, and for those in the Third Year of the Minor Course in Gas Supply Practice.—*Extract from the Authors' preface.*

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recognized by industrialists. A real advantage was that by the automatic control very little attention was necessary, and further that the cost of replacement work was negligible. An excellent finish was given to the products under treatment. On the question of temperature much depended, of course, upon the type of oven used, but he thought a temperature of 350° F. in a box oven would be adequate for the enamelling work on perambulators. It was seldom necessary to exceed, for work of a kindred kind, 430° F.

Mr. E. T. PICKERING inquired if account had been taken in making the heat calculations of the heat evaporated.

Mr. HIND pointed out that it was not possible to supply a formula to cover every kind of heating, because outside factors had to be taken into consideration.

In reply to Mr. G. E. Stevenson (Long Eaton), Mr. Hind, referring to differences in the heat at the top and bottom of the oven, suggested that external air heaters might be used to advantage where uniformity was required. The external air heater had been used largely in America, the hot air being delivered to any point where it was required. It was extremely difficult, he added, to get from manufacturers low-temperature drying equipment.

Mr. F. L. ATKIN (Industrial Research Laboratory, Birmingham) spoke of the importance of conveyor drying ovens, and mentioned that this class of apparatus had been installed for special work at a large rubber factory. With regard to heat calculations, he suggested that some allowance should be made for flue losses, and Mr. Hind agreed with this suggestion.

"Paperette Day" at Perth

Meeting of the Scottish Junior Gas Association (Eastern District), Dec. 3

(*Concluded from p.* 807.)

A NEW AUTOMATIC CUT-OFF FOR CALORIMETERS.

By WILLIAM MASTERTON, B.Sc.Tech., Edinburgh.

Experiences of the failure of water supply to calorimeters, resulting in their destruction, have led to the design of instruments for the purpose of cutting off the gas supply automatically as soon as the water supply fails. There are several types of such instruments which are generally reliable, but, in my view, there is room for considerable improvement, and in the device I describe the faults have been avoided.

Rightly or wrongly, I am prejudiced against instruments having mechanical working parts, which are liable to stick, and fail to operate when required. But, if operative reliability of a safety device is desirable, the avoidance of the need for personal reliability is still more so. The two types at present in general use are not foolproof. In one type the device is locked while the calorimeter is being started up. In the other it is locked while a spot test is being performed on the calorimeter. In either case, a little forgetfulness on the part of the operator—neglecting to unlock the device—would result in the destruction of the calorimeter in the event of water supply failure.

This device, which is patented, has no mechanical working parts and is foolproof.

The gas supply passes through a **U** tube (A on the accompanying drawing) on its way to the calorimeter and the " bleeder " burners (which maintain a draught on the pipe). In the event of water supply failure, the water contained in a reservoir B runs down into the **U** tube and thereby cuts off the gas supply.

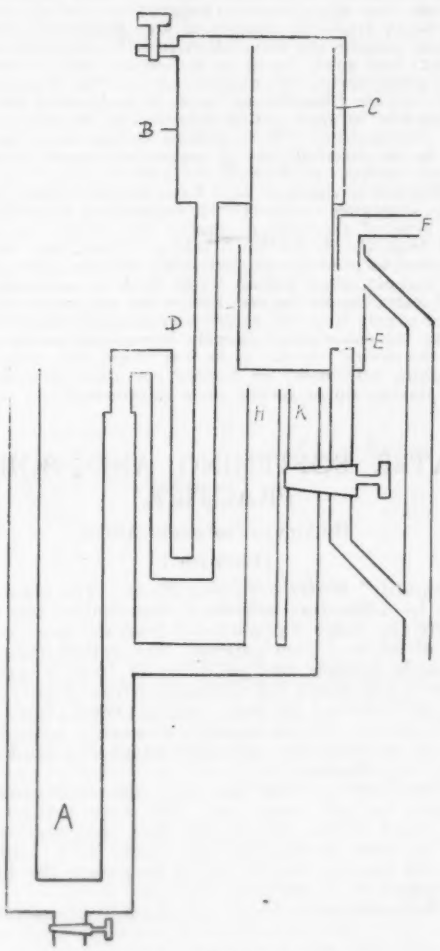
The water reservoir consists of a vertical cylinder fitted with a sealed lid and bottom. Through the bottom plate passes a wide tube C open at both ends, pasing from near the lid to a short distance below the bottom. An **S** tube D lying on its side connects the bottom of the reservoir to the **U** tube, through which gas supply passes. The lower end of the wide tube dips into a cup E, which has a small hole in the bottom and an overflow pipe higher up.

The outlet F of the calorimeter discharges water into this cup, which is overflowing as long as the water supply holds. Should this fail, the cup runs dry through the small hole in the bottom.

When the device is in adjustment, the cup, wide tube, reservoir, and half of the **S** tube are full of water and gas is flowing through the **U** tube. The gas pressure supports the head of water between the water level in **S** tube and overflow of cup. If water supply fails, the cup runs dry and the water in the wide tube drops out, leaving the water in the reservoir unsupported. Hence its contents discharge into the **U** tube and the gas is cut off.

The gas supply coming from the **U** tube divides—one branch H for the " bleeder " burner and the other K for the calorimeter. A tap is fitted to that going to the calorimeter and co-axially with it another in the pipe leading from the small hole in the cup. Thus both taps are opened and shut simultaneously. This is to obtain convenience, combined with maintaining the foolproof qualities of the device. By this arrangement, if gas is turned on to the calorimeter the device is in a position to operate, if necessary. Also, when the calorimeter is shut down, the safety device is not operated, so that it does not require to be set in adjustment on starting up again. Cocks are provided on the **U** tube and on the top of the reservoir to facilitate putting the device in adjustment after it has been called into operation.

A subsidiary property of the arrangement is that in the event of failure of gas pressure, there is again a discharge of water into the **U** tube, so that the subsequent recovery of gas pressure does not result in the escape of gas, the gas ways being choked.



Automatic Cut-Off for Calorimeters.

A further use of the device is as a pressure gauge. As already stated, the gas pressure supports the head of water from the water level in the **S** tube to the overflow level of the cup. The **S** tube is of glass to permit of the pressure being read. It is usual in calorimeter outfits to supply a pressure gauge after the governor, but, where this device is used, the usual pressure gauge can be dispensed with.

I think I can safely claim that this is the only instrument which covers both emergencies—water failure and gas failure with subsequent recovery—in one piece of apparatus. Since the two effects are "convergent," there is no increase in complication or cost in attaining this result. The device is applicable to recording calorimeters as well as spot testing calorimeters.

I have to thank Mr. H. H. Gracie for permission to have the first model of the device made at Granton.

Discussion.

Mr. DAVID VASS (Perth) said that those who had visited the gas-works in the morning had had the privilege of seeing Mr. Masterton's apparatus in use. Mr. Masterton had demonstrated to them its reliability in safeguarding the calorimeter against the disastrous effects that would follow a failure in the water supply; also, were the gas to fail, the instrument would again function and unburnt gas would be prevented from entering the calorimeter. Should the failure be only temporary, the device could be adjusted in a few seconds. He was greatly struck by the simplicity of the design, and congratulated Mr. Masterton on the ingenuity he had shown in producing his apparatus.

Mr. J. M. DOW (Perth), in corroborating Mr. Vass's remarks, said Mr. Masterton must have spent much time and thought in preparing this most useful apparatus. He was struck by the ingenious method which Mr. Masterton had adopted in maintaining the head of water in the reservoir. As far as he could follow, it was the pressure of the atmosphere acting on the surface of the water in the open cup that maintained this head. Should a water failure occur, the water in the open cup and connecting tube between the reservoir and the cup would drain off through the small orifice in the foot of the cup; hence the pressure of the atmosphere would act on the surface of the water in the reservoir, and, this head being superior to the gas pressure, would discharge into the **U**-tube through which the gas supply passed on its way to the calorimeter, and thus block the passage of the gas until the **U**-tube was again drained. He thought that when the Gas Industry as a whole had been given time to study the merits of Mr. Masterton's device it would duly receive the recognition it fully deserved, and the Association had good reason to feel proud that it had in its numbers a member of the inventive skill of Mr. Masterton.

Mr. D. GARRIE (Burntisland) said he understood the device was applicable to spot testing calorimeters as well as to recording calorimeters. When making a spot test, the water having to be diverted into a measuring vessel, would the device not operate and shut off the gas?

Mr. MASTERTON thanked Mr. Vass and Mr. Dow for their remarks. Replying to Mr. Garrie's question, he said that in another type of a similar apparatus the water was certainly diverted from the device when taking a spot test, and a pin was inserted to prevent operation while testing. Forgetting to remove the pin after testing would lead to accidents in the event of water supply failure, but in the instrument described the water supply from the calorimeter passed to the device and thence to the change-over tunnel; hence spot testing did not operate the device. As far as he was aware, this was the only device which introduced no further operation into the procedure of starting-up or testing on a calorimeter.

WATER SOFTENING AND BOILER PRACTICE.

By DAVID GARDNER, Alloa.

[EXTRACT.]

"Permutit" Water Softening Plant.—The plant was installed in 1930 for softening the boiler feed water. Formerly the water was obtained from the town supply at a cost of 8d. per 1000 gallons. The introduction of the plant made possible the use of water from a spring near the works, the water being obtained free of charge. Owing to the extreme hardness of this water, being no less than 16 degrees, its use hitherto was not practicable. By passing it through the softening plant the hardness was reduced to 2 degrees.

The Lancashire Boiler has been operated under these conditions for two years now with very satisfactory results. Proof of this lies in the fact that scaling of the boiler has been practically done away with, and a hose pipe is all that is required when preparing the boiler for inspection.

The following is a statement of costs of operating the plant:—

Actual gallons softened to 2° hardness, 15,000.
Salt used per regeneration, 77 lbs.
Cost of salt per regeneration at 53s. 11d. per ton, 1s. 10d.
Cost per 1000 gallons softened, 1·46d.
Water used per annum, 3,328,800 gallons.
Cost of water if town water were used, £101 5s.
Cost of salt, £20 5s.
Saving per annum on water only, £81.

It will be observed as a result that very hard water—16 degrees hardness—can be softened to a minimum at a comparatively small cost.

Soot Blower.—A soot blower was fitted to the Lancashire Boiler in 1929, and has operated most successfully. By means of the blower, the dust which collects in the fire tubes, flame bed, side flues, and main flue of the boiler is swept away into a collector. The blower is operated by the steam from the boiler at the normal working pressure of 90 lbs. per sq. in., the supply of steam to the blower-pipes in the flues, &c., being regulated by a manifold valve. There are six different positions of the valve, each one operating a separate set of blower jets. To put the blower in action, the wheel is turned to position 1 and kept there for one minute, while one of the fire-tubes is swept clear of dust. The valve is then opened to position 2 for a further period of one minute; at this position the other fire-tube is cleaned. Position 3 puts into operation the blower jets in the flame bed; position 4, the jets in one of the side flues; position 5, the other side flue, and at position 6, the blower jets in the main flue come into action and sweeps the accumulated dust into the collector. Here, the dust meets with a strong downward spray of water and falls to the bottom, where it is removed at a special water-tight door.

The collector is fitted with three dampers—inlet, outlet, and by-pass. Thus, during the period of "blow" the flue gases are by-passed through the collector. The blower is operated once in each 8-hour shift, the time taken in each case being approximately six minutes.

The fuel used in the boiler is rough coke breeze, and the quantity of flue dust collected per shift is about ½ cwt. It is now possible after a period of twelve months of continuous use of the boiler for the inspector to enter the flues after only a simple brushing down, there being no deposit of material to remove.

Shortly stated, the working results following the use of the two plants I have described, are greater ease of steaming of the boiler, saving of expensive fuel to be purchased, and the use only of coke breeze produced at the gas-works. Further, the condition of the boiler as reported upon by the Inspector of the Insurance Company exhibits a complete absence of thickness of scale. In addition, the time of cleaning the inside of the boiler and flues is reduced to only a few hours compared with four or five days previously. Cost of scaling boiler and cleaning flues before installation of "Permutit" plant and soot blower (twice per annum) was £30 6s., while with the two plants in use the cost has been reduced to £3 19s. 6d.

Discussion.

Mr. DAVID VASS (Perth) said that in Perth they were up against a different problem from that of dealing with hard water. The nature of the water was such that its effect was to eat into the boiler plates. The scaling was not heavy, but contained a fairly large percentage of iron. Mr. Gardner had given figures showing the saving on the operating costs since the introduction of the Permutit plant, but one had also to take into consideration the initial expenditure on the plant and labour charges.

Mr. D. STORRIER (Dundee) said that in Dundee at the moment they were considering the question of a water softening plant, although the feed water was of only approximately 4° hardness. Mr. Gardner had not mentioned how long his boilers were run before it became necessary to "blow down." Considering the hardness of the water the speaker was dealing with, and the fact that the density of the water in his boilers must rise very quickly with a certain accumulation of sludge, he assumed "blow down" would require to be done fairly often—say, once per shift. Had they in Alloa done anything to obviate this apparent loss of heat units? In this direction he had in his mind a scheme known as a "continuous return line," by means of which a certain amount of the boiler water was constantly fed back through a coil to the feed water tank, in this way maintaining the boiler water at a reasonable density. This particular method, he believed, was used by the Neckar Water Softening Company. He was surprised to hear that, considering the feed water was not reduced to zero hardness, the boilers merely required hosing out, and that there was no evidence of scale. He was afraid that if the speaker had been dealing with water tube boilers instead of shell boilers he would not be so fortunate in this respect.

Mr. COWIE (Hawick) remarked that in Hawick they were dealing with water of 24° hardness. They had introduced a Neckar plant at Hawick, but found that it did not entirely obviate blowing-down the boiler. He would like Mr. Gardner to give him fuller details of the actual working costs of the Permutit plant.

Mr. GARDNER, in reply, said that the working costs of the Permutit plant were very little. The plant was regenerated every second day, and this occupied little more than half an hour. This was all the attention it required. The boiler was blown down twice a week. They had found no difficulty in working with a water of 2° hardness. At this figure the plant was capable of dealing with 15,000 gallons of water between each regeneration, whereas by working to zero hardness 9000 gallons only could be treated.

British Sulphate of Ammonia Federation, Ltd.

Annual Report for 1931-32

The following extracts are from the Twelfth Annual Report of the Federation for the year ended June 30, 1932:

World's Production and Consumption of Fixed Nitrogen.

During the year under review it is estimated that there was a decrease of 140,584 metric tons of nitrogen, or about 8·3%, in the actual production of the forms of nitrogen enumerated below. The production in Chile decreased by 80,000 tons, or about 32%, and output in other countries decreased by 60,584 tons, or 4%.

The total nitrogen producing capacity of the world at the present time is estimated to be about 3,400,000 tons of nitrogen, exclusive of Chile. The "manufactured nitrogen" industry of the world thus operated at an average of about 42% of capacity.

The total consumption decreased by 61,517 tons, or 3¾%, following on a decrease of 17% last year.

The following figures are offered as fair estimates, but strict accuracy is not claimed for them:

World Production and Consumption of Pure Nitrogen for the Fertilizer Years.

[In Metric Tons.]

—	1929-30.	1930-31.	1931-32.
Production—			
Sulphate of ammonia—			
Bye-product	424,440	359,594	266,471
Synthetic	442,100	349,087	519,120
	866,540	708,681	785,591
Cyanamide	263,800	200,932	134,104
Nitrate of lime	130,500	110,585	79,519
Other forms of nitrogen*—			
Synthetic	427,300	393,150	353,320
Bye-product	51,400	30,940	31,170
Chile nitrate	464,000	250,000	170,000
Total production	2,203,540	1,694,288	1,553,704
Consumption—			
Manufactured nitrogen	1,586,904	1,377,005	1,421,580
Chile nitrate	363,893	244,300	138,208
Total consumption	1,950,797	1,621,305	1,559,788
Agricultural consumption about	1,750,000	1,455,000	1,409,000

* Including nitrogen products used for industrial purposes (except Chile nitrate) and ammonia in mixed fertilizers.

Note.—Fertilizers are included in these tables under the final form as sold, so that, for example, cyanamide if converted into sulphate of ammonia is included under synthetic sulphate of ammonia, or, if into ammophos, is included under other synthetic nitrogen.

The catastrophic fall in prices in the unprotected markets of the world did not cause any stimulation of total nitrogen sales. Agriculturists have, however, shown a decided preference for the forms of nitrogen which were offered at the lowest prices; in particular, for sulphate of ammonia, the consumption of which increased by about 10½%. At the same time, the severely competitive prices being unattractive to any but the most economical manufacturers, production, particularly of bye-product nitrogen, declined, so that for the first time since 1926-27 consumption exceeded production. The general price level for the coming year has been slightly raised; but until arrangements of a more permanent nature have been arrived at with a view to automatic regulation of production to consumption on a world basis, the nitrogen market will remain liable to the risk of violent price fluctuations. The difficulties confronting the industry may be gauged by the fact that despite total nitrogen producing capacity in the world to-day being about 140% greater than present demand and 100% in excess of the record consumption of 1929-30, synthetic nitrogen plants are still being planned and constructed in a number of countries.

There was a remarkable decline in the United States' output of sulphate, due to the depression in the steel industry, and that country has temporarily become on a balance a large importer.

Home Production.

The figures in the following table showing the total production of ammonia products, expressed as sulphate, are calculated on the basis of 25% ammonia (about 20·6% nitrogen). The figures for sulphate of ammonia production and trade, however, apply to actual tons of product with a nitrogen content of about 21%.

Production of Ammonia Products and of Ammonium Sulphate in Great Britain and Ireland and Channel Islands.

[Tons of 2240 lbs.]

Calendar Year.	Total Production of Ammonia Products, Expressed as Sulphate of Ammonia Equivalent (Basis 25% Ammonia).				Included in the Total.	
	England and Wales.	Scotland.	Ireland.	Total Great Britain and Ireland.	Industrial Ammonia Products (Basis 25% Ammonia)*	Sulphate of Ammonia as such (Actual Tons of Product).
1929.	865,698	73,929	3910*	943,537	70,520	840,396
1930.	730,508	69,895	3557*	803,960	85,843	678,442
1931.	611,717	54,311	3977*	670,005	102,827	524,650

* Estimated.

Home Agricultural Consumption.

Home consumption of sulphate of ammonia showed an increase in the 1930-31 figures of 62,464 tons, or 37·6%. The total, 228,278 tons, almost reached the record level of the years at the end of the war. The increase was in all parts of the home market, but was greatest proportionally in Ireland (63%). It was undoubtedly due to the very low prices; it cannot be ascribed to an outstanding increase in the use of ammonium sulphate on any one particular crop, except perhaps on grass in Ireland, but is due partly to increased use for all crops on which sulphate is usually applied, and partly to replacement of the higher priced nitrate nitrogen fertilizers.

Foreign imports amounted to 14,187 tons, a record. Of these, 2382 tons were into the Irish Free State, and of the remaining 11,805 tons into the United Kingdom all but 684 tons were imported before the duty of 20% came into force on April 26, 1932.

Exports.

Total exports from Great Britain and Ireland show a decrease of 80,710 tons, or about 17·7% on last year's figures, but during the year there has been a further considerable reduction in the stocks on hand.

The following figures show the shipments to the principal markets:

—	1929-30.	1930-31.	1931-32.
Spain, Portugal, Canaries	221,380	166,519	184,167
Japan	158,971	52,062	52,159
China and Hong Kong	109,888	72,206	44,314
West Indies, British Guiana, and Mauritius	16,263	16,101	22,859
India and Ceylon	37,312	21,150	35,421
Australia and New Zealand	20,083	15,151	9,498

Propaganda Work.

The decision to maintain all propaganda efforts and staff has been fully justified by the results obtained. Close touch has been kept with agents, merchants, and consumers, and this was of great benefit in combating all forms of competition and in making increased sales at every available point. The low level of prices has undoubtedly created fresh and hitherto untapped goodwill for sulphate of ammonia, which should ensure a permanent increase in consumption.

At June 30, 1932, the Federation consisted of 245 members, and their production for the calendar year 1931 was 91% of all the sulphate of ammonia manufactured in the British Isles.

Parliamentary Intelligence.

[From Our Special Correspondents.]

House of Commons.

Special Orders.

The Grantham Gas Company's Special Order was approved by the House with one modification.

The Liverpool Gas Company's Special Order was approved by the House with two modifications.

Use of Gas-Works Distillates in the Navy.

Mr. Clarry asked the First Lord of the Admiralty to what extent the distillates of gas-works and coke oven tar, particularly creosote oil, were being used by the Admiralty, and what steps were being taken to develop the more extended use of this home-produced fuel without the admixture of imported oil.

The Civil Lord of the Admiralty (Captain Euan Wallace) said in reply that the distillates of gas-works and coke oven tar were not being used as a fuel by the Admiralty. Creosote oil could only be used for this purpose when mixed with a much larger bulk of petroleum oil fuel, but certain research work in this connection was now being carried out by the Fuel Research Station at Greenwich.

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The Stock Exchange finished business for the year 1932 on Friday last in a distinctly happy frame of mind, and there were signs to suggest that the New Year would bring with it a renewal of strength in most markets. Inquiries continued to come in for all classes of securities, and there was a small but steady buying movement for the best class stocks, though in the absence of sellers supplies were very limited and prices hardened in consequence.

The Gas Market was no exception to the general trend of events, and during the three days of opening quite an appreciable volume of business was recorded, but in this section also supplies were very short of requirements, though this is usually the case at this time of the year on account of the close proximity of final dividend disbursements. Prices, therefore, remained firm, and although most of the transactions were recorded at slightly higher prices than the previous week few quotation were affected. Bombay £1 shares went ahead 6d. to 23s.; Brighton 6% consolidated improved from 144½ to 145½, Wandsworth consolidated from 139½ to 140½, and on the local Exchange Liverpool ordinary gained a fraction to 120, while among debenture stocks South Metropolitan 5% redeemable strengthened to 112½.

In accordance with the practice of former years, the lowest and highest prices of recorded transactions during the past year, where available, have been inserted this week in the Stock and Share List. The differences in these prices for 1932 are particularly interesting and gratifying, for it will be seen that in nearly all cases the highest prices are those ruling at the present time. The Imperial Continental Company's stock shows the widest margin with prices ranging from 144 to 209; Maidstone ordinary comes next with a range of 48 points from 120-168, followed by European with 47 points from 80-127, and Colonial Gas Association 8% preference with a margin of 8s. 7½d. per £1 share, while many others are just under 40 points. The price of Gas Light units has increased from 18s. to 25s. 4½d., or nearly 37 points per £100 stock.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *Jan.* 2.

There are no changes to report in the prices of tar products, which remain as follows:

Pitch is firm at 160s. per ton f.o.b.

Creosote, 3½d. to 5d. per gallon f.o.b., according to specification.

Refined tar is about 4½d. per gallon in bulk at makers' works.

Pure toluole is about 2s. 5d.; pure benzole, about 1s. 11d. to 2s.; solvent naphtha, 95/160, is about 1s. 8d; and 90/140 pyridine bases, 3s. 9d. to 4s.—all per gallon naked at makers' works.

Tar Products in the Provinces.

Jan. 2.

The average prices of gas-works products during the week were: Gas-works tar, 33s. to 38s. Pitch—East Coast, 85s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 85s. f.o.b.* Toluole, naked, North, 1s. 7½d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 5½d. to 5¾d. Solvent naphtha, naked, North, 1s. 4d. to 1s. 4½d. Heavy naphtha, North, 10½d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2½d. to 2¾d.; low gravity, 1¼d.; Scotland, 2½d. to 2¾d. Heavy oils, in bulk, North, 4¾d. to 5¼d. Carbolic acid, 60's, 2s. to 2s. 1d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o b. In order to arrive at the f.a s value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Dec.* 31.

The year closes with prices fairly steady in most departments, and with prospects for the future quite bright.

Crude gas-works tar.—The actual value is 45s. to 50s. per ton *ex* works.

Pitch continues firm in tone, and export value here is nominal at 92s. 6d. to 95s. per ton f.o.b. Glasgow. In the home market business is quiet, but value is unchanged at 95s. to 100s. per ton *ex* works, according to quality.

Refined tar to Ministry of Transport Specification is commanding more attention, particularly for forward delivery. Quotations are steady at 3¾d. to 4d. per gallon f.o.r. naked.

Creosote oil.—Market is dull, with prices easy. B.E.S.A. Specification is 3d. to 3½d. per gallon; low gravity, 2¾d. to 3¼d. per gallon; and neutral oil, 3d. to 3½d. per gallon—all *ex* works in bulk.

Cresylic acid.—No change can be recorded. Pale, 97/99%, is 11d. to 1s. per gallon; dark, 97/99%, 10d. to 11d. per gallon; and pale, 99/100, 1s. 2d. to 1s. 3d. per gallon—all f.o.r. in buyers' packages.

Crude naphtha.—Supplies are scarce, with value round 4½d. to 5d. per gallon f.o.r., according to quantity and quality.

Solvent naphtha.—90/160 grade is 1s. 2d. to 1s. 3d. per gallon, and 90/190 grade 11d. to 1s. per gallon.

Motor benzole is featureless, and the price is round 1s. 4d. to 1s. 5d. per gallon *ex* works.

Pyridines.—90/160 grade is 3s. to 3s. 3d. per gallon, and 90/140 grade 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time.

	s. d.		s. d.	
Crude benzole	0 10½	to	0 11	per gallon at works
Motor ,, ...	1 6½	,,	1 7	,, ,, ,,
Pure ,, ...	1 10	,,	1 11	,, ,, ,,

Trade Notes.

Change of Address.

The new address of Messrs. Parkinson & Cowan, Ltd., as from Jan. 2, is Terminal House, Grosvenor Gardens, London, S.W. 1. Telephone No. Sloane 0111 (4 lines).

Simplex Water Gas Plants.

Mr. J. W. Gibson, Gas-Works, Lymington, inventor of the Simplex and New Gibson water gas plants, has granted a sole license to Messrs. J. R. Masters & Sons, Ltd., 59, Ashness Gardens, Greenford, Middlesex, for manufacture. The plants have been designed to meet the needs of all sizes of undertakings.

Klönne Holder Contract.

A contract for a Klönne dry gasholder of 2 million c.ft. capacity has been placed by British (Guest, Keen, Baldwins) Iron and Steel Company, Ltd., with Thomas Piggott & Co., Ltd., of Birmingham. The holder is designed with a diameter of 126 ft. and a total height of 206 ft., and will be used for the storage of blast furnace and coke oven gas in connection with the developments at their Port Talbot and Margam Works. In this installation the gasholder will serve as an accumulator and balancer, maintaining constant pressure to the various points of consumption, including the sleeper plant furnace, the plate normalizing furnace, the billet heating furnace, and water-tube boilers.

Diaries, Calendars, &c.

Further seasonable gifts in the form of diaries, calendars, &c., have been received from the following friends, whose good wishes we heartily reciprocate:

BLUE SEAL PRODUCTS, LTD., The Field House, Bream's Buildings, London, E.C. 4.

BROTHERTON & CO., LTD., City Chambers, Leeds.

CHANCERY LANE PRINTING WORKS, LTD., Plough Court, Fetter Lane, London, E.C. 4.

CHEMICAL TRADE JOURNAL AND CHEMICAL ENGINEER, 265, Strand, London, W.C. 2.

DAVISON & PARTNER, LTD., 11, Carteret Street, Westminster, S.W. 1.

DOUGALL'S GAS METERS, LTD., Chiswick Mall, London, W. 4.

GIBBONS BROS., LTD., AND GIBBONS (DUDLEY), LTD., Dibdale Works, Dudley.

W. C. HOLMES & CO., LTD., Whitestone Ironworks, Huddersfield.

SIMON-CARVES, LTD., Cheadle Heath, Stockport.

JOHN THOMLINSON, LTD., Stanley Works, Partick, Glasgow.

Contracts Advertised To-Day.

Meters.

The Stretford and District Gas Board invite tenders for the supply of meters. [Advert. on p. 57.]

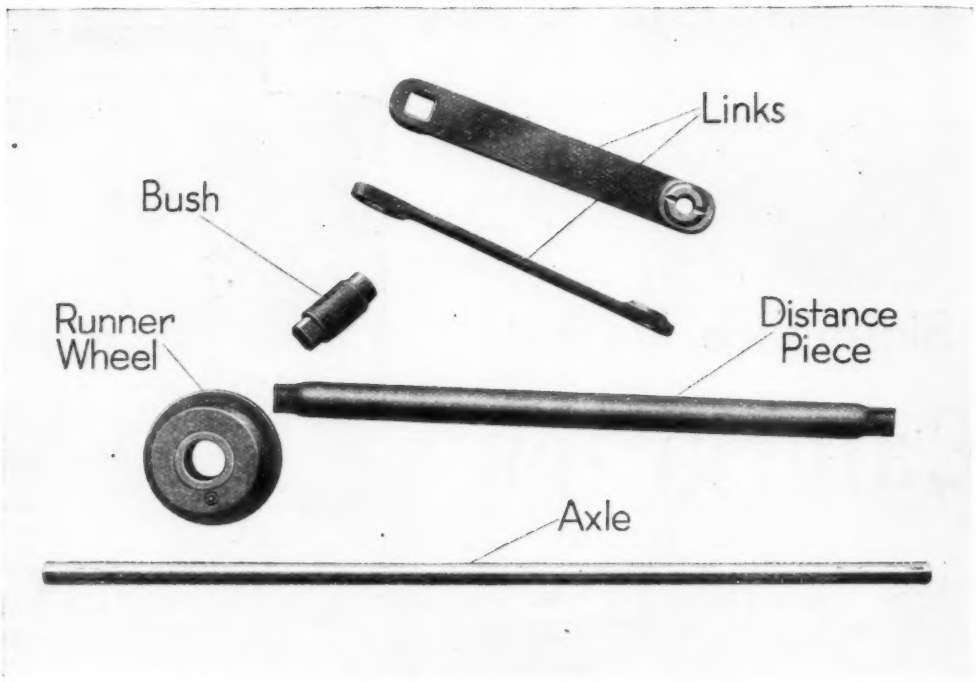
Simmance Patent

Calorgraph

- Type R -

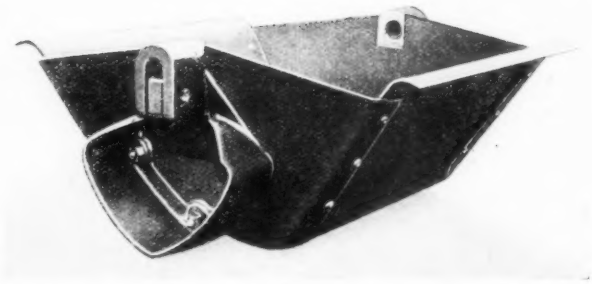
has been
approved
by
The Gas Referees.

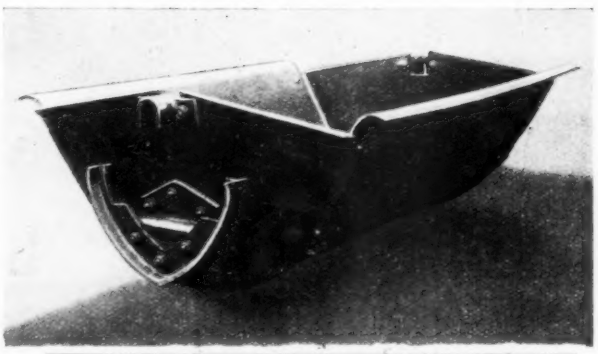
ALEXANDER WRIGHT & CO LTD
1. WESTMINSTER PALACE GARDENS, VICTORIA STREET,
WESTMINSTER. S.W.1
Telephone VICTORIA 1207.
Telegrams: PRECISION, SOWEST, LONDON



POWER CONSUMPTION

is reduced to the minimum by the design of component parts, and by automatic lubrication in the West lip-bucket conveyor





COMPONENT PARTS AND BUCKETS FOR 70 TONS-PER-HOUR AND 100 TONS-PER-HOUR WEST LIP-BUCKET CONVEYORS

WEST'S

Gas Improvement Company, Ltd.

DESIGNERS, MANUFACTURERS & ERECTORS OF GLOVER-WEST VERTICAL RETORTS & WEST HANDLING PLANT

TELEPHONE: COLLYHURST 2961 (4 LINES)
TELEGRAMS: "STOKER, MANCHESTER"

MILES PLATTING, MANCHESTER

London
Regent House, Kingsway, W.C. 2.
Tel. Address: "Imvertret, Westcent, London."
Telephone: Holborn 4108.

Paris
Cie. Gle. de Construction de Fours, 8, Place des Etats-Unis, Montrouge (Seine).

New York
West Gas Improvement Co. of America Incorporated.
441, Lexington Ave., New York.
Tel. Address: "Verticals, New York."
Telephone: Murray Hill 2-7242.

Sydney
Union House, 243, George Street, Sydney, N.S.W.
Tel. Address "Vertical, Sydney."
Telephone: B 5868.

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

[For Stock Market Report, see earlier pages.]

Issue	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Dec. 30.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Year 1932.
£			% p.a.	% p.a.				
1,551,868	Stk.	Oct. 3	7½	7½	Alliance & Dublin Ord. ...	105—115	...	100—121½
374,000	,,	July 4	4	4	Do. 4 p.c. Deb. ...	80—90	...	68½—92½
557,655	,,	Aug. 22	7	7	Barnet Ord. 7 p.c.	132—142	...	121½—145
300,000	1	Oct. 17	1/9½	1/4½	Bombay, Ltd.	22/—24/-	+/6	15/1½—24/-
177,750	Stk.	Aug. 22	9	9½	Bournemouth sliding scale	195—205	...	180—202½
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	145—155	...	134—155
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	135—140	...	126—139
50,000	,,	Dec. 19	3	3	Do. 5 p.c. Deb. ...	75—80*	...	71—77½
162,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	98—103*	...	75½—102½
210,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	117—122*	...	93—125
357,900	,,	Aug. 22	7½	7½	Brighton, &c. 6 p.c. Con. ...	143—148	+1	115½ 147
540,000	,,	,,	6½	6½	Do. 5 p.c. Con. ...	127—152	...	105—132
195,500	,,	,,	6	6	Do. 6 p.c. B Pref.	135—145	...	105—140
1,287,500	,,	Aug. 8	5	5	Bristol 5 p.c. max.	108—110a	...	§
120,420	,,	Dec. 19	4	4	Do. 1st 4 p.c. Deb. ...	96—98a*	...	§
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	95—97a*	...	§
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	115—120a*	...	§
855,000	,,	Oct. 3	8	7	British Ord.	142—147	...	109½—147
100,000	,,	Dec. 19	7	7	Do. 7 p.c. Pref.	140—150*	...	112—145
350,000	,,	,,	—	5½	Do. 5½ p.c. Pref. ...	105—110*	...	108½
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	90—95*	...	78—95
460,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	105—115*	...	95—107
160,000	,,	July 4	5	5	Cambridge 5 p.c. Deb. ...	117—122	...	115—121½
100,000	10	Dec. 5	6	6	Cape Town, Ltd.	7½—8¼	...	7½—9
100,000	10	Nov. 7	4½	4½	Do. 4½ p.c. Pref. ...	6—7	...	6⅞—6⅞
150,000	Stk.	Dec. 19	4½	4½	Do. 4½ p.c. Deb. ...	88—93*	...	69—95
626,860	,,	Aug. 8	6	6	Cardiff Con. Ord.	110—115	...	101—105½
237,860	,,	July 4	2½	5	Do. 5 p.c. Red. Deb.	105—110	...	101½—105
157,150	,,	Aug. 8	6½	5	Chester 5 p.c. Ord.	93—98b	...	90—93½b
98,986	1	Oct. 17	2/-	2/-	Colombo, Ltd. Ord.... ...	25/—80/-	...	27/—28/6
609,204	1	Oct. 17	-/10 90	-/11 47	Colonial Gas Assn. Ltd. Ord.	16/—18/-	...	10/6—17/6
296,053	1	,,	1/2 54	1/3 30	Do. 8 p.c. Pref.	19/6—21/6	...	12/6—21/1½
1,822,505	Stk.	Aug. 8	5½	5	Commercial Ord.	110—115	...	91½—109½
475,000	,,	Dec. 19	3	3	Do. 3 p.c. Deb. ...	73—78*	...	54—78
240,744	,,	—	—	—	Do. 5 p.c. Deb. ...	117—122	...	118—124
807,560	,,	Aug. 8	7	7	Croydon sliding scale ...	139—144	...	105—143
469,590	,,	,,	5	5	Do. max. div.	95—100	...	82—100
500,000	,,	July 4	5	5	Do. 5 p.c. Deb.	120—125	...	99—124
542,270	,,	Aug. 8	10	7	Derby Con.	150—166c	...	§
55,000	,,	July 4	4	4	Do. 4 p.c. Deb.	75—85c	...	§
209,000	,,	Sept. 5	5	5	East Hull Ord. 5 p.c. ...	97—102	...	72½—100½
179,500	,,	Aug. 22	5½	6	East Surrey Ord. 5 p.c. ...	110—120	...	88½—115
155,019	,,	Dec. 19	5	5	Do. 5 p.c. Deb. ...	116—121*	...	100—122
1,002,180	,,	Sept. 19	16½	15	European, Ltd.	122—127	...	80—127
19,405,992	,,	Aug. 8	5⅝	5⅝	Gas Light & Coke 4 p.c. Ord.	24/6—25/6f	...	18/—25/4½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	80—85	...	54—85⅝
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	98—101	...	71—103½
6,102,497	,,	Dec. 19	3	3	Do. 3 p.c. Con. Deb. ...	77—81*	...	54½—82½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	113—116*	...	93½—117
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	107—111*	...	84—113
264,011	,,	Aug. 22	—	6	Harrogate New Cons. ...	110—115	...	100½—112
82,500	,,	Aug. 22	7	7	Hastings & St. L. 5 p.c. Conv.	130—140	...	96½—136¾
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	102—107	...	84—107
70,000	10	Oct. 17	†10	†10	Hongkong & China, Ltd. ...	9½—10½	...	10½—11½
218,200	Stk.	Aug. 22	6	6	Hornsey Con. 3½ p.c. ...	117—122	...	90—122
5,600,000	,,	Nov. 21	14	10	Imperial Continental Cap.	198—208	...	144—209
228,130	,,	Aug. 8	3½	3½	Do. 3½ p.c. Red. Deb.	90—95	...	69—93½
235,242	,,	Aug. 8	8½	8½	Lea Bridge 5 p.c. Ord. ...	152—162	...	129—162
2,145,907	,,	Aug. 22	6	6	Liverpool 5 p.c. Ord. ...	119½—120½b	+½	95½—120½b
245,500	,,	Dec. 19	5	5	Do. 5 p.c. Red. Pref. ...	100—110b*	...	100—104½b
306,083	,,	July 15	4	4	Do. 4 p.c. Deb. ...	100—102b	...	85—101b
165,736	,,	Sept. 5	10	8	Maidstone 5 p.c. Cap. ...	160—170	...	120—168
56,176	,,	Dec. 19	3	3	Do. 3 p.c. Deb. ...	68—73*	...	70—71½
75,000	£	Dec. 5	†10	†10	Malta & Mediterranean ...	7½—8½	...	6½—8½
892,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	98—103	+1	80—101
171,978	Stk.	Sept. 5	5	5	M. S. Utility "C." Cons. ...	100—110	...	78—105
718,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	90—95	...	70—92
112,126	,,	July 4	4	4	Do. 4 p.c. Deb. ...	95—100	...	72—98
148,955	,,	,,	5	5	Do. 5 p.c. Deb. ...	115—120	...	98½—99
675,000	,,	21 May '31	†6	†6	Montevideo, Ltd.	35—45	...	34½—41½
2,061,315	,,	Aug. 8	5½	5	Newcastle & Gateshead Con.	23/—24/-d	...	§
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	94—95d	...	§
691,705	,,	June 20	3½	3½	Do. 3½ p.c. Deb. ...	89—91d	...	§
277,285	,,	Nov. 7	5	5	Do. 5 p.c. Deb. '43...	103—107d	...	§
274,000	,,	Aug. 8	5	5	Newport (Mon.) 5 p.c. max.	93—95a	...	106—145
199,940	,,	Aug. 22	7½	7½	North-Middlesex 6 p.c. Con.	135—145	...	83 94
896,160	,,	Aug. 8	5	5	Northampton 5 p.c. max. ...	96—101	...	88½—110
300,000	,,	Dec. 5	7	9	Oriental, Ltd.	109—114	...	116—150
205,162	,,	Dec. 19	8	8	Plym'th & Stonehouse 5 p.c.	140—150*	...	120—158½
504,416	,,	Aug. 22	8	8	Portsm'th Con.Stk. 4 p.c.Std.	150—160	...	76½—100
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	97—102	...	97—101.5a
114,000	,,	Aug. 8	5	5	Preston 5 p.c. Pref.	105—110	...	76—81½
686,812	,,	July 18	4	4	Primitiva 4 p.c. Rd. Db. 1911	77—82	...	79—81
389,813	,,	Dec. 19	4	4	Do. 4 p.c. Cons. Deb.	75—80*	...	78—78½
150,000	10	Sept. 19	6	6	San Paulo 6 p.c. Pref. ...	6⅞—7½	...	§
1,736,968	Stk.	Sept. 5	6	6	Sheffield Cons.	112—115a	...	§
95,000	,,	July 18	4	4	Do. 4 p.c. Deb.	92—96a	...	94—117½
133,201	,,	Sept. 5	5	8½	Shrewsbury 5 p.c. Ord. ...	118—123	...	3⅜—3¾
90,000	10	June 6	15	15	South African	4—6	...	96—124½
6,709,895	Stk.	Aug. 8	7	5	South Met. Ord.	121—126	...	104—143
1,185,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	138—143	...	54—84
1,895,445	,,	July 4	3	3	Do. 3 p.c. Deb. ...	78—82	...	94—115
1,000,000	,,	July 18	4	5	Do. 5 p.c. Red. Deb.	110—115	+1	§
91,500	,,	Aug. 8	8½	8½	South Shields Con.	140—145d	...	100½—123
1,543,795	,,	Aug. 8	6	6	South Suburban Ord. 5 p.c.	118—123	...	98—117
300,000	,,	,,	5	5	Do. 5 p.c. Pref.	113—118	...	93—125½
668,887	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	117—122*	...	77—105
647,740	,,	Aug. 22	5	5	Southampt'n Ord. 5 p.c. max.	102—107	...	75—97
121,275	,,	Dec. 19	4	4	Do. 4 p.c. Deb.	95—100*	...	108—113½
350,000	,,	Aug. 8	—	9/-	Swansea 5½ p.c. Red. Pref.	110—114	...	102½—110
200,000	,,	Dec. 19	6½	6½	Do. 6½ p.c. Red. Deb.	103—108*	...	103½—136
1,076,490	,,	Aug. 8	6½	6½	Tottenham and District Ord.	131—136	...	104—125
300,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	120—125	...	74—100
199,005	,,	Dec. 19	4	4	Do. 4 p.c. Deb. ...	95—100*	...	70
85,701	,,	Sept. 19	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	67—72	...	103—139½
846,069	,,	Aug. 22	7	7	Uxbridge, &c., 5 p.ct. ...	130—140	...	87—115
88,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	112—117	...	110—143
1,322,220	,,	July 4	7	7	Wandsworth Consolidated	138—143	+1	89—119½
1,096,373	,,	,,	5	5	Do. 5 p.c. Pref.	113—118	...	93—125
1,317,964	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	117—122*	...	105—111½
158,400	,,	Aug. 22	6g	5	Winchester W.&G.5p.c.Con.	107—112	...	

Quotations at :—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g* Paid £3, including 10s. on account of back dividends. *Ex. div. † Paid free of income-tax. ‡ For year. § Figures not available.

(This announcement is inserted gratuitously.)

PETER—WITH ONE EXCEPTION

With one exception Peter is an ordinary little fellow. Chubby, likeable, just five-and-a-half, full of life and fun and on occasions—be it admitted—of naughtiness.

Just now Peter's rather important, for this is his first term at school, and he's grappling with the intricacies of "A B C" and "Twice Two": difficult subjects to all men of five-and-a-half, but even more difficult in Peter's case because—bad luck—he's totally blind. That's his One Exception.

Peter learns reading, writing, and 'rithmetic through the medium of "Braille"—dull stuff compared with the coloured picture books of most five-and-a-halfs. However, he's a stout lad is Peter, and he's making great progress.

Would you like to know more about him? How, in spite of his "One Exception," he is being educated, and, when older, technically trained and usefully employed.

There is a long waiting list of "Peters" throughout the British Isles, for whom training and accommodation must be provided in the immediate future.

Will you help with a donation or annual subscription? Any sum, large or small, will be gratefully received.

Here's a suggestion. Your eyesight is worth 3d. a year to you. Send Peter and his handicapped pals 3d. for every year you've had it. Now, please, in case it slips your memory. Good idea!

THE CHAIRMAN,

SCHOOL FOR THE BLIND

(Founded 1838),

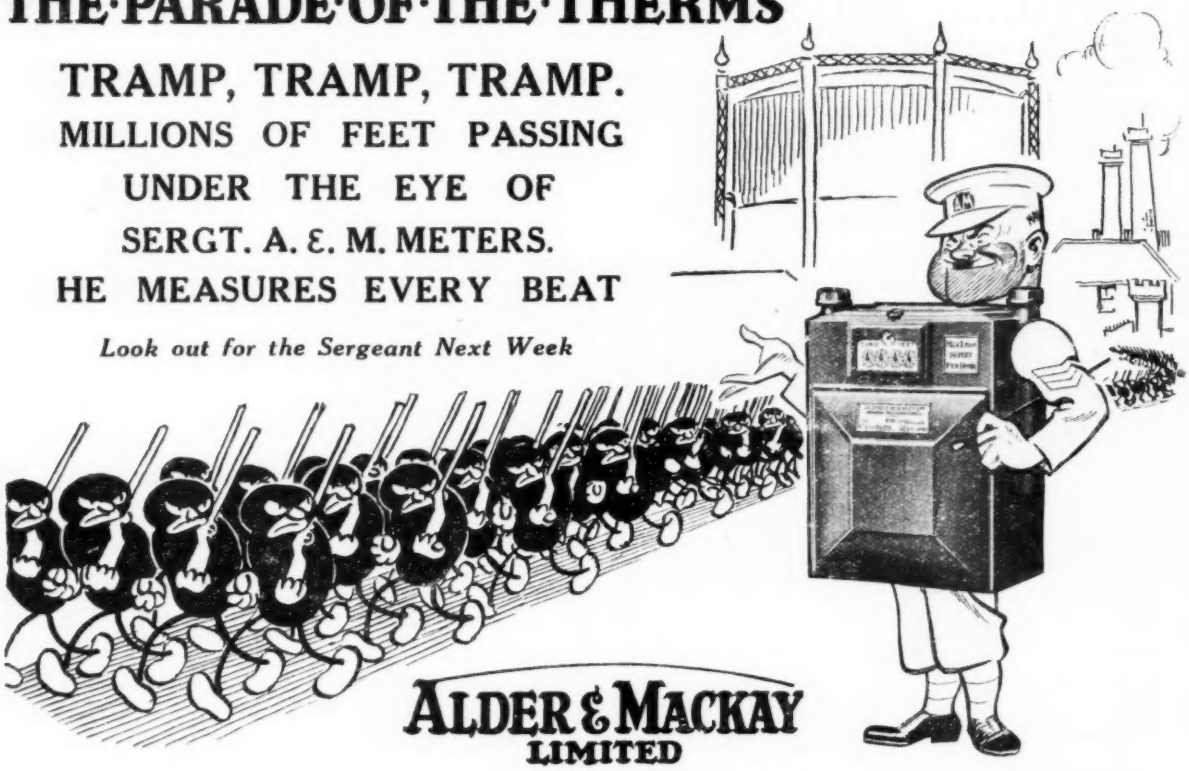
Swiss Cottage, LONDON, N.W. 3

THE·PARADE·OF·THE·THERMS

TRAMP, TRAMP, TRAMP.

MILLIONS OF FEET PASSING
UNDER THE EYE OF
SERGT. A. & M. METERS.
HE MEASURES EVERY BEAT

Look out for the Sergeant Next Week

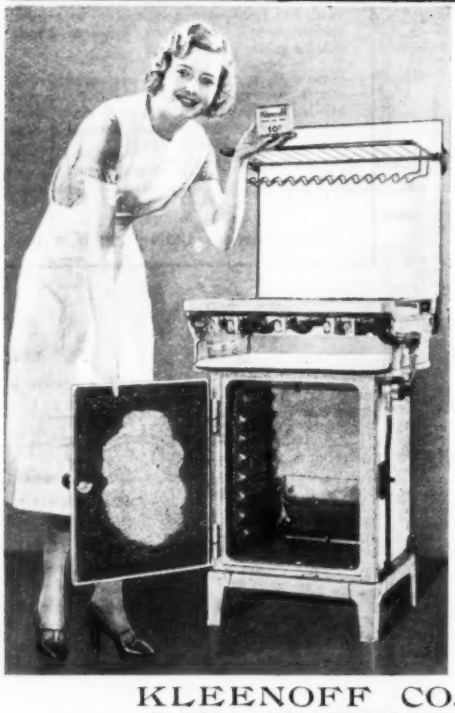


ALDER & MACKAY LIMITED

MAKE METERS OF METICULOUS MEASUREMENT

ALDER & MACKAY LTD., EDINBURGH, LONDON & BRANCHES.

Kleenoff cleans cookers



It's so easy with "Kleenoff" to remove even the hardest grease. No scouring required.

Stock "Kleenoff" in your showrooms.

10d.
PER LARGE TIN.

Consistently and extensively advertised.

Supplied in ½-cwt. drums and 14-lb. tins extra Strong for use in Stove shops.

KLEENOFF CO.,
(Proprietors : Bale and Church, Ltd.)
33, ST. MARY-AT-HILL, LONDON, E.C. 3

PEEBLES & CO. LTD

GAS GOVERNORS
FOR 1933.

Peebles' Gas Governors owe their pre-eminence not only to their design, but also to the first-class workmanship which enters into their manufacture ; every care is taken to turn out governors of sound construction and lasting quality.

In Peebles Governors is embodied the experience of nearly seventy years.

We shall be glad to quote you for any of the following types.

PRESSURE, WATER, OR CLOCK-LOADED STATION GOVERNORS. DISTRICT GOVERNORS. HIGH-PRESSURE GOVERNORS. RETORT GOVERNORS. GAS FIRE GOVERNORS. STREET LAMP GOVERNORS. SERVICE GOVERNORS.

PEEBLES & CO. LTD.
Jay Works
Bonnington,
EDINBURGH

E.I.H.

PUBLISHERS' NOTICE.

TO CORRESPONDENTS: No notice can be taken of anonymous communications, unless authenticated by the name and address of the writer (not necessarily for publication).

TO ADVERTISERS.

NOON ON TUESDAY is the latest hour for receipt of advertisement copy for the following day's issue.

FIRST POST ON MONDAY is the latest for receipt of alterations of standing advertisements.

RATES FOR UNDISPLAYED ADVERTS: Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum 4s. 6d. An additional charge of 6d. is made where replies are addressed c/o the "JOURNAL."

Full Schedule of Advertising Rates on application.

TERMS OF SUBSCRIPTION.

United Kingdom and Ireland	Advance Rate	35 - per annum 18 - per half year.
	Credit Rate	40 - per annum. 21 - per half year.
Dominions and Colonies ...		35/- per annum, in advance.
United States (through United States Agent)		$3.50 per annum, in advance.
Other Countries in the Postal Union.		40 - per annum, in advance.

A copy of the "G.J." Calendar and Directory is presented to Continuous Subscribers.

Subscribers who desire to avail themselves of the reduction in the Subscription by paying in advance for the current Year are reminded that this can only be done up to the end of January.

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Dividends payable in respect of the Half-Year ending the 31st inst. will be remitted by Warrant forwarded by post on the 28th of February, 1933, to those Proprietors who were the Holders of Capital Stocks when the Transfer Books were closed, or their Authorized Agents.

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To receive the Directors' Report and the Accounts of the Company for the Year ended the 31st of December, 1932.
To declare a Dividend for the Half-Year ended the 31st of December, 1932.
To elect Directors and an Auditor in the place of those retiring.

The STOCK TRANSFER BOOKS WILL BE CLOSED from the 10th of January to the 9th of February next, both days inclusive; and the Dividends will be paid on the 15th of February next to the holders of Stock registered at the date of the closing.

NOTICE IS HEREBY ALSO GIVEN that an EXTRAORDINARY MEETING of the said Company will be held at the same place, and on the same day, at 12.30 o'clock in the afternoon (or so soon thereafter as the business of the said Ordinary Meeting shall have been concluded), for the purpose of submitting to the Proprietors, for their consideration and approval, the provisions of the Bill now before Parliament, intituled "A Bill to prohibit the making by housing authorities of conditions as to the form of light heat power or energy to be supplied or used in certain cases in the limits of supply of the Commercial Gas Company; and for other purposes."

By order of the Board,
F. J. BRADFIELD,
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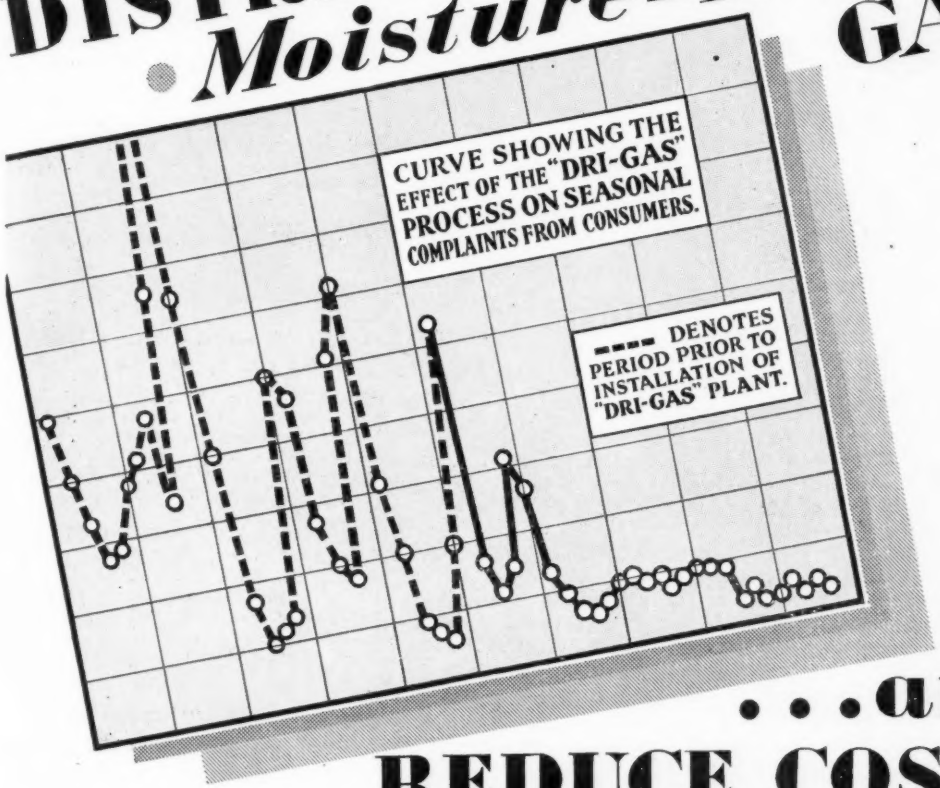
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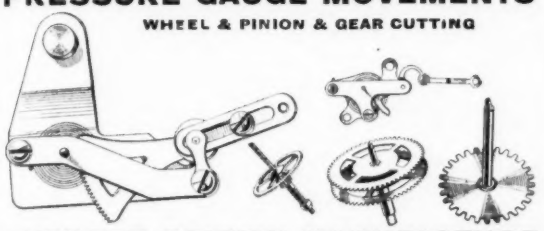

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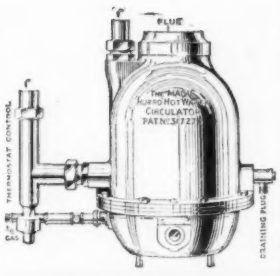

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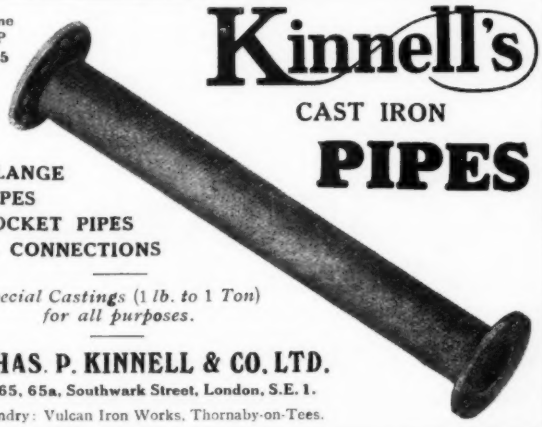

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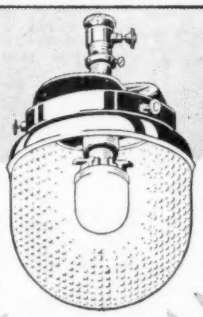

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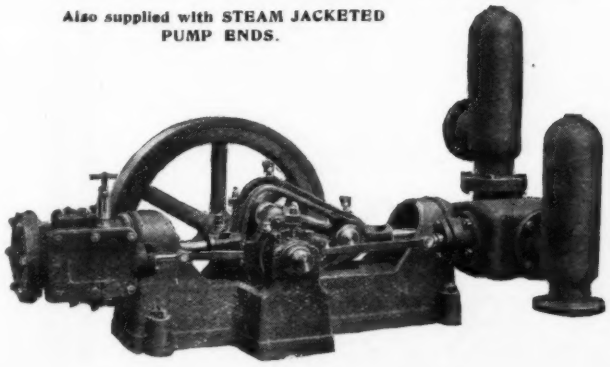

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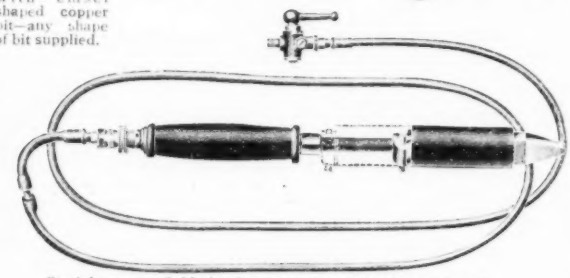

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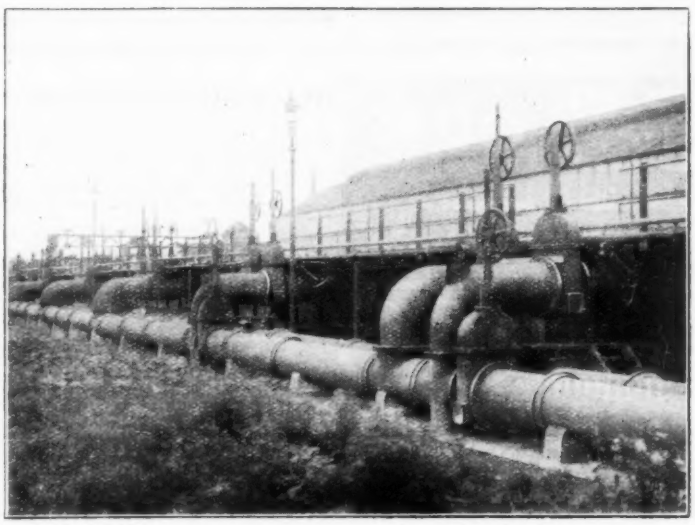

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